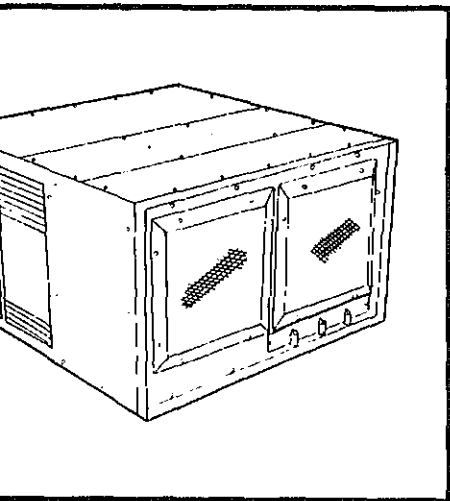




# **DIRECT SUPPORT MAINTENANCE MANUAL**

## **R CONDITIONER BTU/HR COOLING**



**TEL MODEL HAC-751)  
(4120-01-085-4732)**

**TROUBLESHOOTING**

**3-1**

**OPERATOR'S  
MAINTENANCE**

**3-1**

**ORGANIZATIONAL  
MAINTENANCE**

**4-1**

**TROUBLESHOOTING**

**4-22**

**DS MAINTENANCE**

**5-1**

**APPENDICES**

**A-1**

**INDEX**

**1**

15-4120-341-13, 13 March 1981, is changed as follows:

The U.S. Air Force number is being added to this manual. All future revisions will include the U.S. Air Force.

Remove and insert pages as indicated below. New or changed text is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

i and ii

F-1 and F-2

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Insert pages

i and ii

F-1 and F-2

F-3/F-4

Retain this sheet in front of manual for reference purposes.

Order of the Secretaries of the Army and the Air Force:

**CARL E. VUONO**

*General, United States Army  
Chief of Staff*

**R. L. DILWORTH**

*Major General, United States Army  
The Adjutant General*

**LARRY E. WELSH, C**

*Chief of Staff*

**ALFRED G. HANSEN**

*Major General, USAF, Commander, Air Force*



**Disconnect the power source before performing any maintenance function.**

**Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).**

**Death or serious injury may occur if capacitor is not discharged prior to removal.**

**Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that Refrigerant 12 does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.**

**Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.**

**Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F creates phosgene gas.**

9,000 BTU/HR COOLING  
(HOTTEL MODEL HAC-751)  
(4120-01-085-4732)

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

help improve this manual. If you find any mistakes or if you know  
to improve the procedures, please let us know. Reports shall be  
as follows: A reply will be furnished to you.

DA Form 2028 (Recommended Changes to Publications and Blank  
DA Form 2028-2 located in the back of this manual direct to  
U. S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300  
Boulevard, St. Louis, MO 63120-1798 .

Force - AFTO Form 22 directly to: Commander, Sacramento Air  
Center, ATTN: MMST, McClellan Air Force Base, CA 95652 in  
ce with TO-00-5-1.

1	<b>INTRODUCTION</b> .....
	<b>CHAPTER OVERVIEW</b> .....
I	<b>GENERAL INFORMATION</b> .....
1-1	Scope .....
1-2	Maintenance Forms and Records .....
1-3	Destruction of Army Material To Prevent Enemy Use .....
1-4	Reporting Equipment Improvements Recommendations (EIR's) .....
1-5	List of Abbreviations .....
1-6	Hand Receipt .....
II	<b>EQUIPMENT DESCRIPTION</b> .....
1-7	Purpose of Air Conditioner .....
1-8	Location and Description of Major Components .....
1-9	Differences Between Models .....
1-10	Performance Data (Organizational Maintenance) .....
1-11	Performance Data (Direct Support Maintenance) .....
III	<b>TECHNICAL PRINCIPLES OF OPERATION</b> .....
1-12	General .....
1-13	Cooling .....
1-14	Ventilation .....

	3-4	General	.....
	3-5	Housing Panels	.....
	3-6	Air Diffuser and Return Air Grills	.....
	3-7	Control Panel Switches	.....
ER 4		<b>ORGANIZATIONAL MAINTENANCE INSTRUCTIONS</b>	.....
		<b>CHAPTER OVERVIEW</b>	.....
ction	I	REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT	.....
	4-1	Maintenance Repair Parts	.....
	4-2	Common Tools and Equipment	.....
	4-3	Special Tools and Test Equipment	.....
	4-4	Consumable Materials	.....
ction	II	SERVICE UPON RECEIPT	.....
	4-5	Service Upon Receipt Checklist	.....
ction	III	OPERATION UNDER USUAL CONDITIONS	.....
	4-6	Assembly and Preparation For Typical Use	.....
	4-7	Position the Unit	.....
	4-8	Mount the Unit	.....
	4-9	Connect the Power Source	.....
	4-10	Initial Adjustments	.....
	4-11	Fan Rotation Check	.....
	4-12	Return Air Grill Check	.....
ction	IV	PREVENTIVE MAINTENANCE CHECKS AND SERVICES	.....
		(PMCS) ORGANIZATIONAL	.....
	4-13	General	.....
	4-14	Preventive Maintenance Checks and Services (PMCS)	.....
ction	V	<b>ORGANIZATIONAL TROUBLESHOOTING</b>	.....
	4-15	General	.....
	4-16	Organizational Troubleshooting Table	.....
ction	VI	ORGANIZATIONAL MAINTENANCE PROCEDURES	.....
	4-17	General	.....
	4-18	Housing Panels and Grills	.....
	4-19	Air Filter	.....
	4-20	Fan Motor	.....
	4-21	Condenser Fan	.....
	4-22	Circulating Fan	.....
	4-23	Self-Service Guide	.....

5-9	Compressor .....
5-10	Refrigerant Piping and Service Valves .....
5-11	Evaporator Coil .....
5-12	Condenser Coil .....
5-13	Dehydrator .....
5-14	Sight Glass .....
5-15	Expansion Valve .....

## APPENDICES

DIX A	REFERENCES .....
DIX B	COMPONENTS OF END ITEM LIST .....
DIX C	MAINTENANCE ALLOCATION CHART .....
DIX D	ADDITIONAL ORGANIZATION LIST .....
DIX E	EXPENDABLE SUPPLIES AND MATERIALS LIST .....
DIX F	DIAGRAMS .....

## INDEX

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## R OVERVIEW

ose of this chapter is two-fold:

provide you with the standard data required in all manuals (i.e. forms and record data).

acquaint you with the air conditioner. This is done by giving you a physical and n of those major equipment parts that you are likely to come in contact with.

## Section I. GENERAL INFORMATION

E

Manual: Operator's, Organizational, and Direct Support Maintenance

Number and Equipment Name: HAC-751 Air Conditioner: Floor Mounted, Air Cooled  
ven, 3/4 HP, 60 Hertz AC, Single Phase, 9,000 BTU/HR

of Equipment: Provide filtered, cooled air to a desired predetermined range and circulation  
cooling of equipment or personnel within the air conditioned area.

## NTENANCE FORMS AND RECORDS

nt of the Army forms and procedures used for equipment maintenance will be those  
-750, the Army Maintenance Management Systems (TAMMS).

## STRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use, for in  
struction.

## ORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

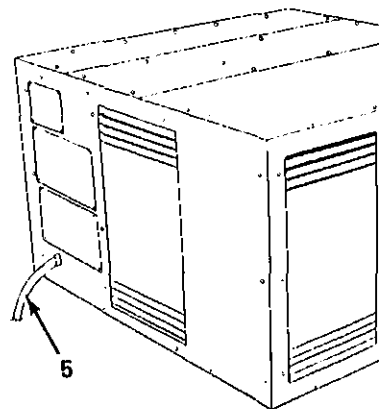
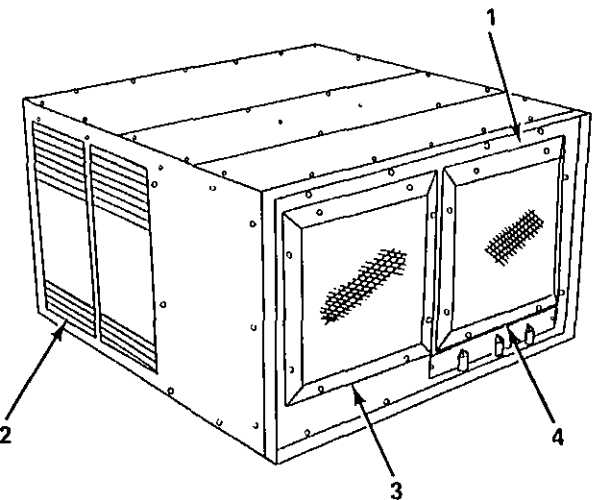
r conditioner needs improvement, let us know. Send us an EIR. You, the user, are th  
tell us what you don't like about your equipment. Let us know why you don't like the c  
procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it





## 8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

1. Return Air Grill - Adjustable and controls the amount of air passing through the air coil.
2. Condenser Inlet - Directs flow of air to condenser.
3. Air Diffuser Grill - Directs flow of evaporator outlet air.
4. Control Panel - Contains all control switches.
5. Power Cable - For connection to 115 volts, 60 Hz, single phase power source.



Additional Stock Number ..... 4120-01-085-4  
 Model ..... HAC  
 Length ..... 27 5/8 in. (701.675  
 Width ..... 26 1/2 in. (673.1  
 Height ..... 15 5/8 in. (396.875  
 Capacity ..... 9,000 BTU  
 Weight ..... 153 lbs. (69.40

#### Compressor (B1).

Manufacturer ..... Hupp, Incorporated  
 Model ..... EH751A2  
 Military Part Number ..... 13221E4  
 Units .....  
 Voltage ..... 50  
 Phase ..... S  
 Weight (with oil) ..... 70 pounds

#### Motor (B2).

Manufacturer ..... Dayton Electric Mfg. Company  
 Model ..... 3M0  
 Military Part Number ..... 13221E4  
 Units .....  
 Phase ..... S  
 RPM ..... 1250/1  
 Horsepower .....  
 Duty ..... Continuous  
 Motor Drive ..... Drive  
 Thermal Protector ..... Automatic reset type open at 165°C (329°F)  
 Rotation (lead end) ..... Counterclockwise

#### Start Capacitor (C1).

Manufacturer ..... Cornell Dubilier Electronics  
 Part Number ..... ETW460-  
 Military Part Number ..... 13221E4  
 Type ..... Fixed aluminum electrolytic  
 Capacitance ..... 500mfd  
 Working Voltage ..... 125

#### Run Capacitor (C2).

Manufacturer ..... General Electric Company  
 Part Number ..... 21A

Primary Part Number ..... 140 to 153 volts at 35° C (95° F), 150 to 160 volts at 95° C (200° F)  
 Contacts Open ..... 140 to 153 volts at 35° C (95° F), 150 to 160 volts at 95° C (200° F)  
 Contacts Close ..... 20 to 40 volts at 35° C (95° F), 20 to 40 volts at 95° C (200° F)

### Primary Selector Switch (S1).

Manufacturer ..... Oak Industries, Incorporated  
 Number ..... 2401  
 Primary Part Number ..... 13221  
 Number of Switch Positions ..... 2

### Thermostat (S2).

Manufacturer ..... A3C  
 Number ..... 13221  
 Primary Part Number ..... 13221  
 Contacts Close (temp. drop) ..... SPST, normally closed  
 ..... 69° F to 71° F (20.6° C to 21.1° C)

### Expansion Valve

Manufacturer ..... The Singer Co., Controls Division  
 Number ..... 22  
 Primary Part Number ..... 13221  
 Tube Length ..... 1/4 in.  
 Tube Length ..... 1/2 in.  
 Tube Length ..... 60 in. (1,524 mm)  
 Initial Capacity ..... 1  
 Heat (factory set) ..... 8 1/2° F to 9 1/2° F bath temperature (-13° C to 13° C)  
 ..... at a 0° C bath temperature

### Glass.

Manufacturer ..... Mueller Brass Company  
 Number ..... A  
 Primary Part Number ..... 13221

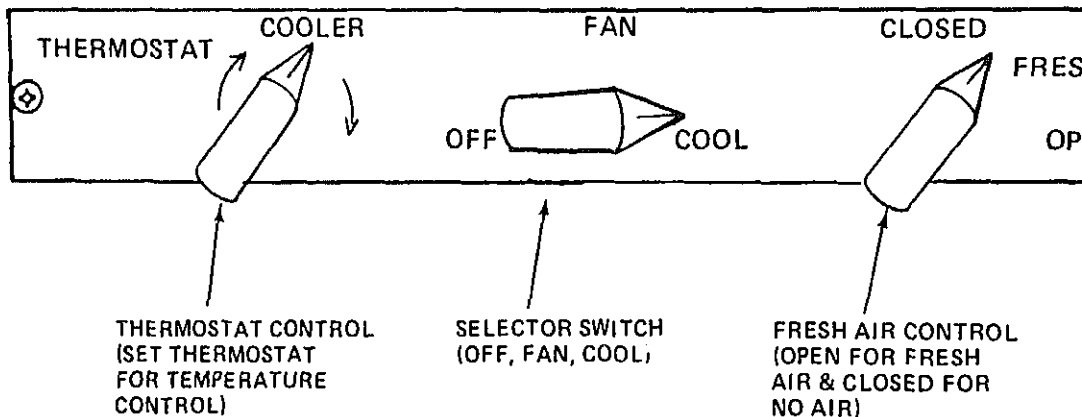
## PERFORMANCE DATA (DIRECT SUPPORT MAINTENANCE)

### Drum

Manufacturer ..... S  
 Number ..... 13214  
 Primary Part Number ..... 13214


## 1-13. COOLING

With the selector switch in the COOL position the fan motor and the compressor are energized and run continuously. The flow within the refrigerant circuit determines the mode of unit. With the fan motor and compressor operating, the flow within the refrigerant circuit is controlled by the THERMOSTAT switch.






**THERMOSTAT CONTROL**  
(SET THERMOSTAT  
FOR TEMPERATURE  
CONTROL)



**SELECTION SWITCH**  
(OFF, FAN, COOL)



**FRESH AIR CONTROL**  
(OPEN FOR FRESH  
AIR & CLOSED FOR  
NO AIR)

	<b>Para</b>	<b>Page</b>
<i>Operating Instructions on Decals and Instruction Plates</i>	2-7	2-9
Operating Procedures	2-3	2-6
Operation Under Unusual Conditions	2-8	2-10
Preventive Maintenance Checks and Services	2-2	2-2

## PERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

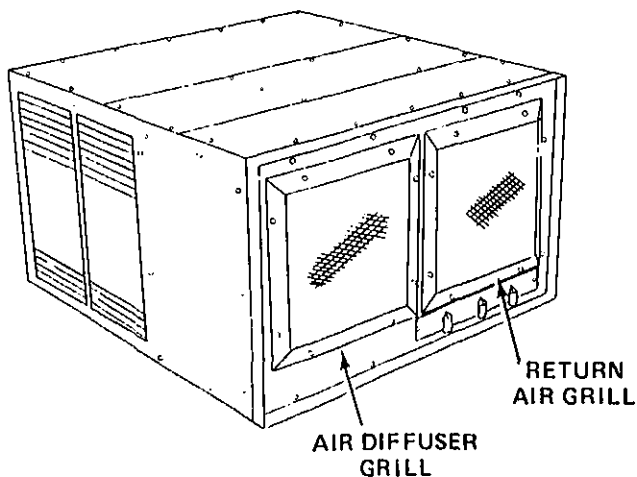
### NOTE

If the equipment must be kept on continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

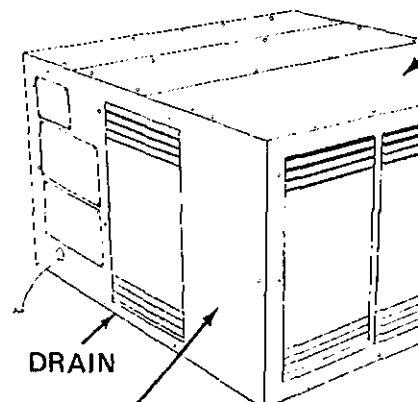
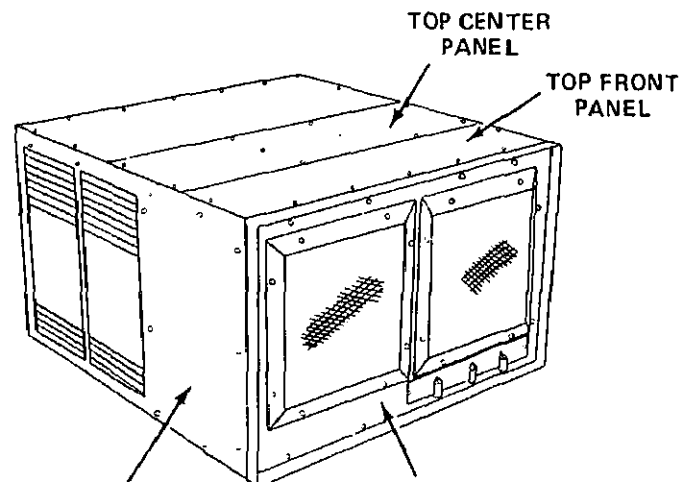


Return Air Grill

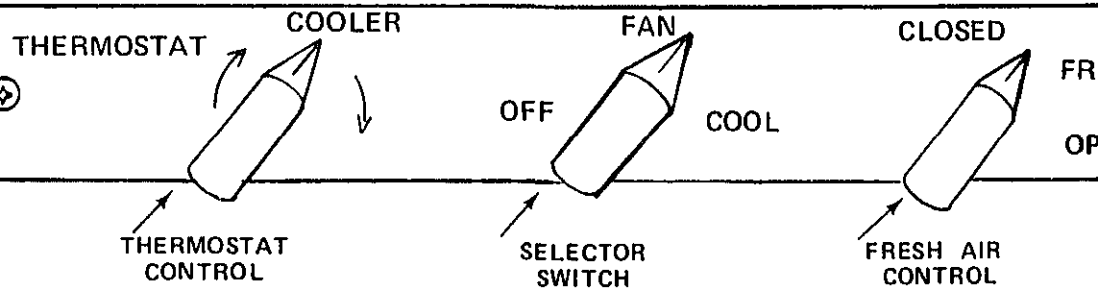
Inspect for cleanliness, obstructions, damage, and security of attachment. Rotate FRESH AIR control to adjust return air grill.



No.	B	D	A	Inspected	Or Adjusted As Necessary	Available
3	●		●	Housing Panels	Inspect for security of attachment and cleanliness. Report damaged condition to organizational maintenance personnel.	
4	●		●	Drains	Inspect drains for obstructions. Remove obstructions as required.	



Item No.	Interval			Item to be Inspected	Check For and Have Repaired or Adjusted As Necessary	Equipment is Available
	B	D	A			
5	●			Switches	Insure knobs are in place and check to see that switches function properly. Report damaged condition to organizational maintenance personnel.	



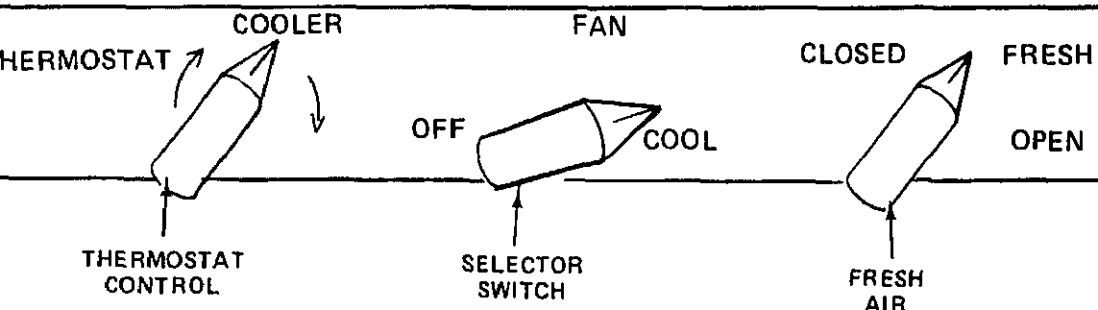
Only the COOLER position for the THERMOSTAT is marked on the front panel.

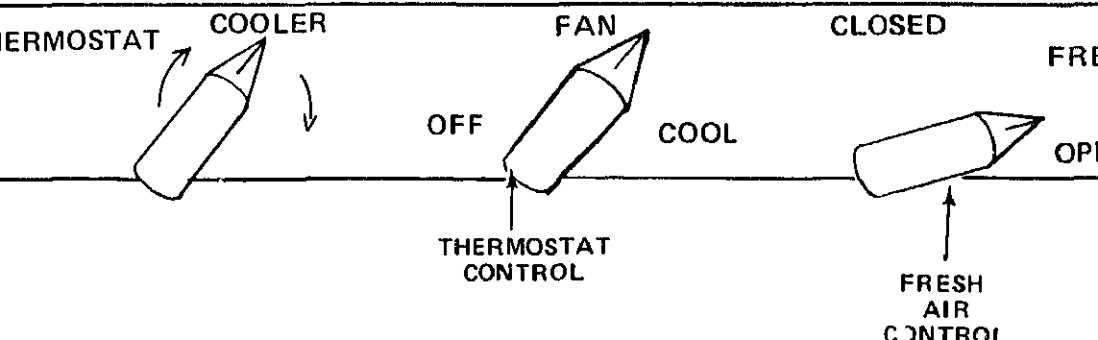
Set THERMOSTAT control to desired temperature.

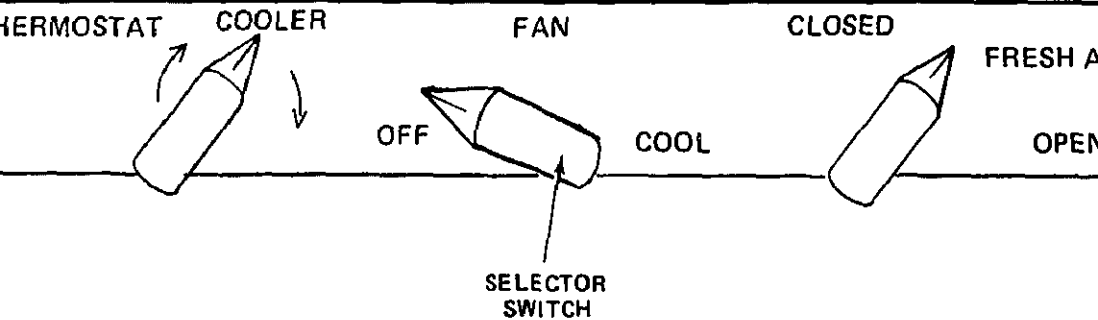
Place FRESH AIR control in desired position (OPEN for fresh air and CLOSED for no air).

Place selector switch in the FAN position to start fans.

Place selector switch in the COOL position. When the temperature in the area is above the THERMOSTAT setting, the air conditioner will provide cooling air.







RMOSTAT COOLER FAN CLOSED FRESH A  
OFF COOL OPEN

U. S. ARMY TROOP SUPPORT COMMAND

AIR CONDITIONER: FLOOR MTG; AIR  
COOLED; ELECTRIC MOTOR DRIVEN, 3/4-HP  
AC 115V, SINGLE PHASE, 60 HZ:  
9000BTU/HR

NSN 4120-01-085-4732

PART NO. ASSY 97403-13221E4580

MFD BY HARVEY W. HOTTEL, INC.

CONTRACT NO. DAAJ09-79-C-5143

y reducing the capacity of the air conditioner.

*Grills and Louvers.* Keep all grills and louvers clean and free of any obstructions to maintain through the air conditioner.

*Coils.* Clean evaporator and condenser coils as frequently as necessary to prevent dirt or other obstructing the air flow.

## **OPERATION IN DUSTY OR SANDY AREAS**

*Protection.* Shield the air conditioner from dust as much as possible. Take advantage of any rers which offer protection.

*Cleaning.* Keep the air conditioner as clean as possible. Pay particular attention to the louvers, electrical components and grills.

*Air Filters and Coils.*

Under extremely dusty or sandy conditions, the louvers, coils, electrical components and grillrviced more often.

## **NOTE**

**Never operate the unit without having the air filters in place.**

The condenser coil is subjected to ambient air. Therefore, it requires cleaning more often than the evaporator coil.





	Para	Page
Lubrication Instructions	3-1	3-1
Operator Troubleshooting	3-2	3-1
Operator Troubleshooting Table	3-3	3-1
Operator's Maintenance Procedures	3-4	3-2

## Section I. LUBRICATION INSTRUCTIONS

lubrication is required.

## Section II. TROUBLESHOOTING

### GENERAL

This section provides information useful in diagnosing and correcting unsatisfactory operation of the air conditioner. Each malfunction is followed by a list of probable causes and actions to correct the malfunction. You should perform the tests/inspections and corrective actions in the order listed. This manual cannot list all malfunctions that may occur; nor all tests or inspections that may be required. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

### TROUBLESHOOTING TABLE

Action

Test or Inspection

Corrective Action

### AIR CONDITIONER

#### AIR CONDITIONER FAILS TO OPERATE

- Step 1. Check to see if main power cord is plugged in.  
Connect power cable to receptacle supplying 115 VAC, single phase, 60 Hz power.
- Step 2. Check to see if selector switch is in OFF position.  
Place selector switch in FAN or COOL position.

#### INSUFFICIENT COOLING

#### 4. GENERAL

The following information pertains to all procedures for the operator.

##### INITIAL SETUP

**Applicable Configurations**  
All

**Special Environmental Conditions**  
None

**Test Equipment**  
None

**Special Tools**  
None

**Personnel Required**  
Operator

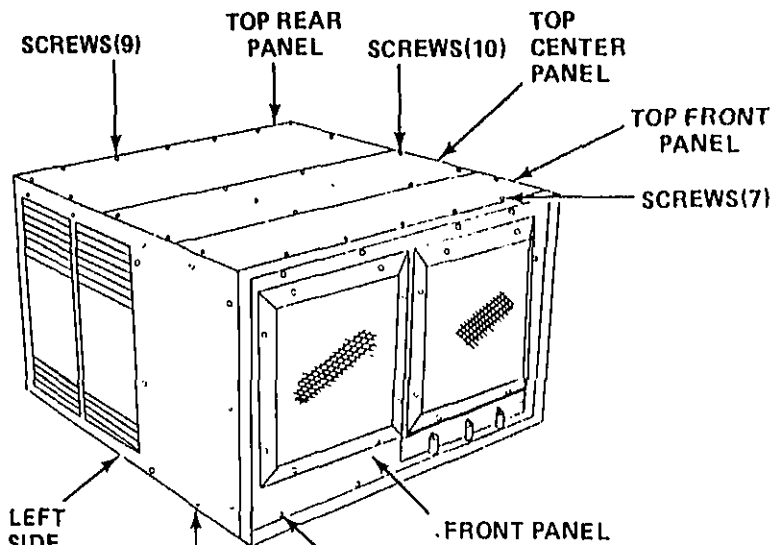
##### General Safety Instructions

Disconnect the power source before performing maintenance function. Do not use compressed air for cleaning purposes except where reduced pressure (less than 30 psi) and then only with effective guarding and personal protective equipment.

---

LOCATION/ITEM	REMARKS	ACTION
<b>INSPECTION AND SERVICE</b>		
<b>FRONT OF HOUSING</b>		
<div>WARNING</div> <p>Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).</p>		
Front Panel		<ol style="list-style-type: none"> <li>Brush off any loose dirt or from front panel.</li> <li>Wipe off front panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.</li> <li>Inspect front panel for security of attachment and damage.</li> <li>Report damaged condition to maintenance personnel.</li> </ol>
Left Side Panel		<ol style="list-style-type: none"> <li>Brush off any loose dirt or from left side panel.</li> <li>Wipe off left side panel with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.</li> <li>Inspect left side panel for security of attachment and damage.</li> <li>Report damaged condition to maintenance personnel.</li> </ol>

- b. Wipe off top panels with a cloth with dry cleaning solvent, P-D-68.
- c. Inspect top panels for security and damage.
- d. Report damaged condition to maintenance personnel.



Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

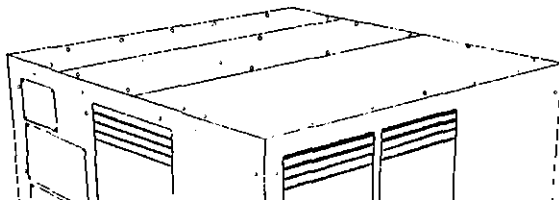
#### Rear Panel

- a.* Brush off any loose dirt or from rear panel.
- b.* Wipe off rear panel with a cloth with dry cleaning solvent, P-D-680 or P-S-661.
- c.* Inspect rear panel for security of attachment and damage.
- d.* Report damaged condition to maintenance personnel.

#### RIGHT SIDE OF HOUSING

##### Right Side Panel

- a.* Brush off any loose dirt or from right side panel.
- b.* Wipe off right side panel with dry cleaning solvent, P-D-680 or P-S-661.
- c.* Inspect right side panel for attachment and damage.
- d.* Report damaged condition to maintenance personnel.



Material/Parts  
 Air Diffuser Grill  
 Return Air Grill  
 Dry Cleaning Solvent

AIR CONDITIONER, Malfunction 2, S

Approximate Time Required (in minutes)  
 Inspection and Service 15  
 Adjustment 5  
 TOTAL TIME 20

References  
 None

LOCATION/ITEM

REMARKS

ACTION

## INSPECTION AND SERVICE

### OF HOUSING

#### WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near flame or excessive heat. Flash point of solvent is 100° F (38° C).

Diffuser Grill

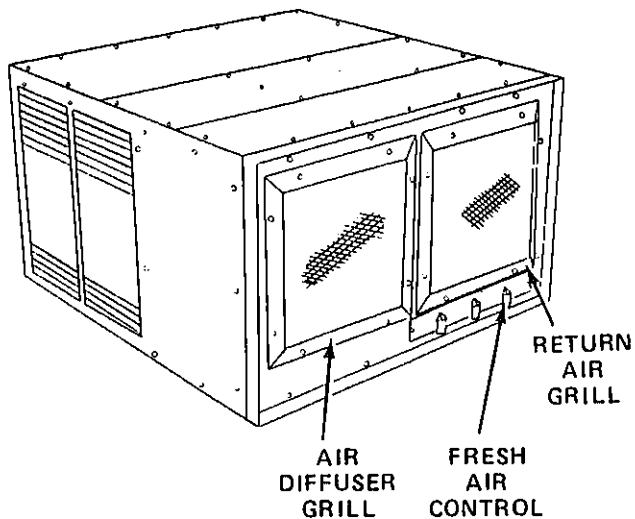
- Brush off any loose dirt or foreign material from air diffuser grill.
- Wipe off air diffuser grill with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect for and remove any obstruction.
- Inspect air diffuser grill for secure attachment and damage.
- Report damaged condition to organization maintenance personnel.

Return Air Grill

- Brush off any loose dirt or foreign material from return air grill.
- Wipe off return air grill with a cloth moistened with dry cleaning solvent, P-D-680 or P-S-661.
- Inspect for and remove any obstruction.
- Inspect return air grill for secure attachment and damage.

air control from CLOSED to FRESH  
OPEN positions.

- b. Verify return air grill louvers operation.
- c. Report damaged condition to ordnance maintenance personnel.





None

TOTAL TIME

LOCATION/ITEM

REMARKS

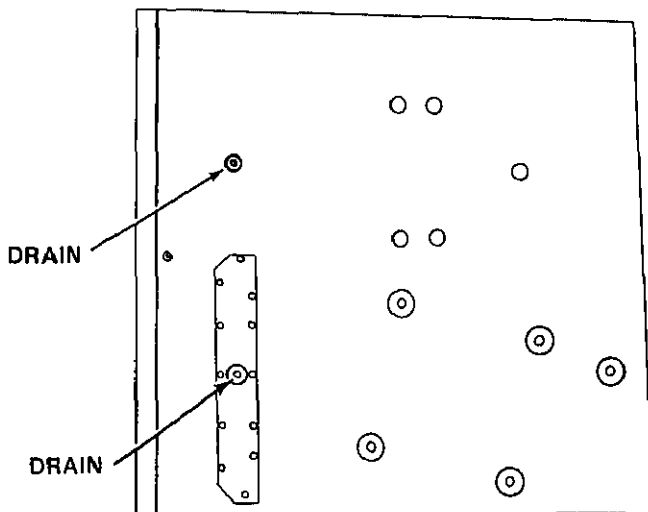
ACTION

**INSPECTION AND SERVICE**

FRONT OR REAR

Drains

- a. Inspect drains for obstructions.
- b. Use a piece of soft wire to remove





Organizational Maintenance Procedures	4-17
Organizational Troubleshooting	4-15
Organizational Troubleshooting Table	4-16
Organizational Preventive Maintenance Checks and Services (PMCS)	4-14
Preparation For Movement	4-36
Service Upon Receipt Checklist	4-5
Special Tools and Test Equipment	4-3

## Section I. REPAIR PARTS, SPECIAL TOOLS, TM AND SUPPORT EQUIPMENT

### MAINTENANCE REPAIR PARTS

Parts for the air conditioner are listed and illustrated in TM 5-4120-341-23P.

### COMMON TOOLS AND EQUIPMENT

Common tools and equipment, refer to the Table of Organization and Equipment (TOE).

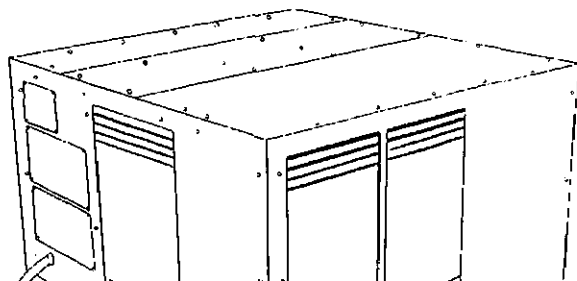
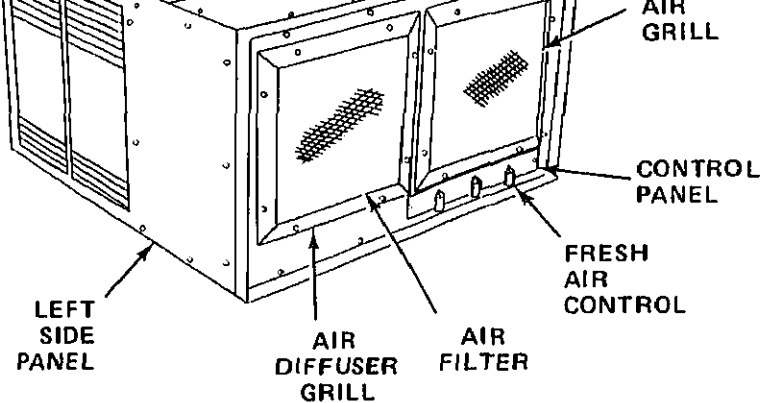
### SPECIAL TOOLS AND TEST EQUIPMENT

Special tools or test equipment are required.

### CONSUMABLE MATERIALS

Item No.	Name	Spec
	Coater, Air Filter	MIL-
	Dry Cleaning Solvent	P-D-
	Dry Cleaning Solvent	P-S-
	Adhesive	MMN

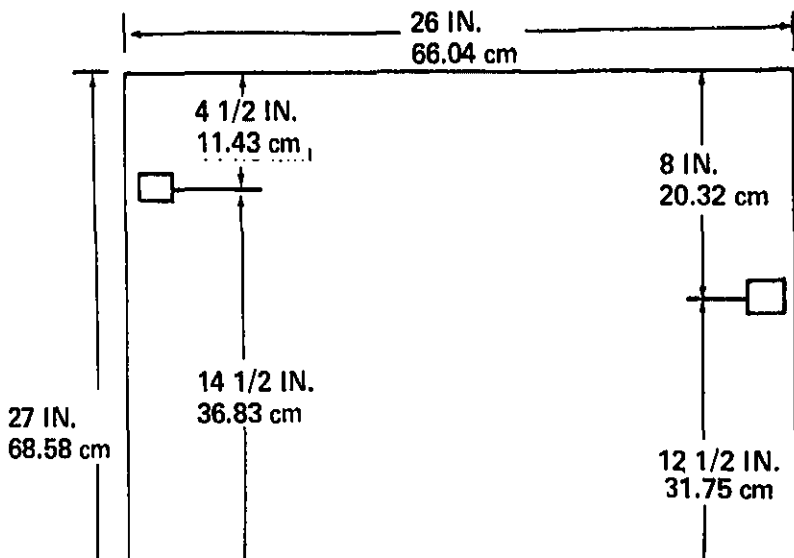
Front	Air Filter	<p><i>a.</i> Remove top front panel.</p> <p><i>b.</i> Remove air filter and inspect the filter for accumulation of dirt.</p> <p><i>c.</i> Clean or reject filter.</p>	Pa
Front	Return Air Grill	<p><i>a.</i> Check to see that the FRESH AIR control moves freely between the OPEN and CLOSED position and that the return air grill opens and closes properly.</p> <p><i>b.</i> Adjust or reject FRESH AIR control.</p>	Pa
Front	Control Panel	<p><i>a.</i> Check for broken or damaged knobs. Insure that switches and controls move freely from position to position.</p> <p><i>b.</i> Reject any component that is found to be malfunctioning.</p>	Pa
Right Side	Power Cable	<p><i>a.</i> Inspect power cable electrical connector for damage.</p> <p><i>b.</i> Repair or reject power cable.</p>	Pa

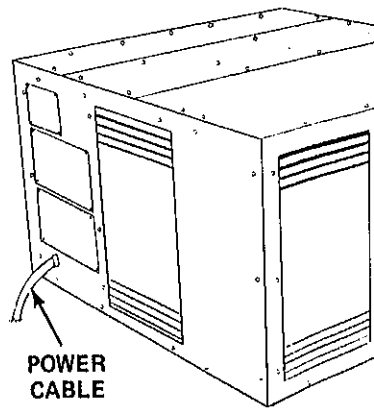
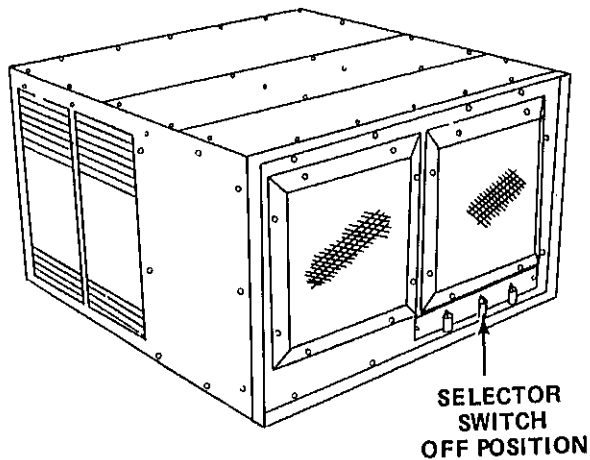


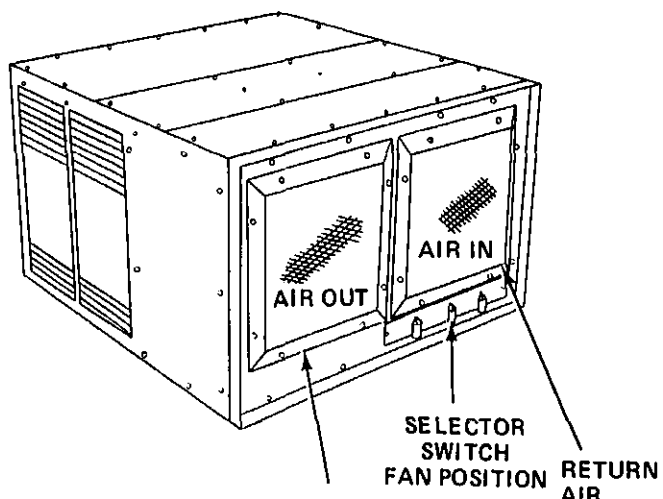
unloading. Pick a place that is as level as possible. Install the air conditioner in a van, shelter through an opening 15 7/8 inches (40.3225 cm) high by 26 1/4 inches (66.675 cm) long. Make sure the air conditioner is installed so there is no restriction on the air flow, so that return air will have the greatest amount of warm air in the space to be cooled. Make sure that the control panel is accessible to the operator and maintenance personnel.

#### 4-8. MOUNT THE UNIT

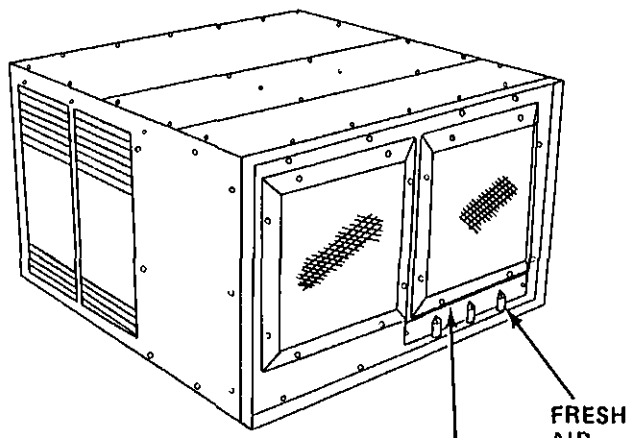
Brace the air conditioner with two (2) brackets to resist shock. Bolt the air conditioner to the wall using the four (4) threaded holes in the bottom of the air conditioner.











#### 4. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

**WARNING**

Dry cleaning solvent, P-D-680, or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

**WARNING**

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Remove screws (12) securing air filter cover to bottom of air conditioner. Remove air filter cover and gasket.

Slide air filter down and out of air conditioner.

### **WARNING**

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

Clean air filter with P-D-680 or P-S-661 dry cleaning solvent or warm soapy water and dry with low-pressure compressed air.

Inspect air filter for damaged or clogged condition. Replace air filter if damage is indicated.

Inspect two (2) rubber pads on bottom of air filter for damage. Replace pads if damage is indicated. Secure pads with adhesive per specification MMM-A-121.

Dip or spray air filter with filter-kote or oil per specification MIL-L-2104 Grade 20, 30 or better. Drain off excessive oil before installation.

Slide air filter up into air conditioner.

Install gasket and air filter cover and secure with twelve (12) screws.

inspect fan motor for security of attachment.

Remove two (2) oil port caps and add SAE-20 oil every year. Replace oil port caps.

Align holes in right side panel with holes in housing.

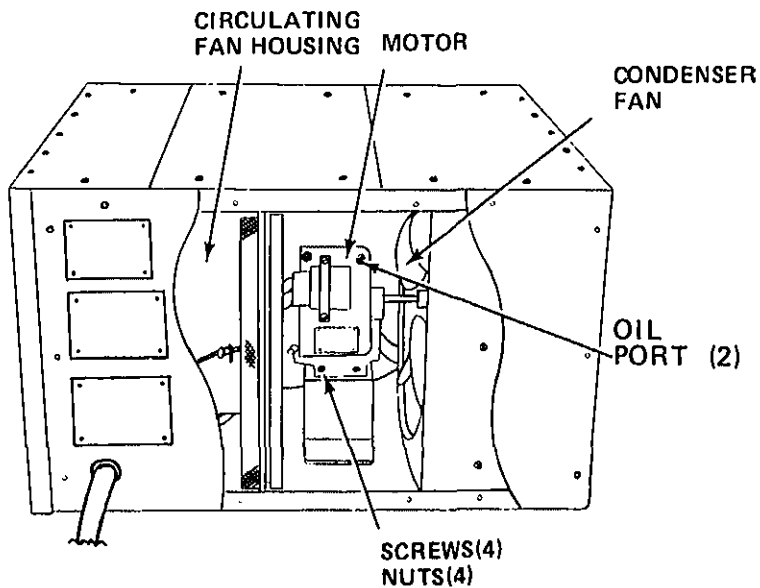
Secure right side panel with seventeen (17) screws.

Remove seventeen (17) screws securing right side panel to housing. Remove right side panel.

Inspect condenser fan for cleanliness and damage.

Inspect circulating fan for cleanliness and damage.

## ● Fans

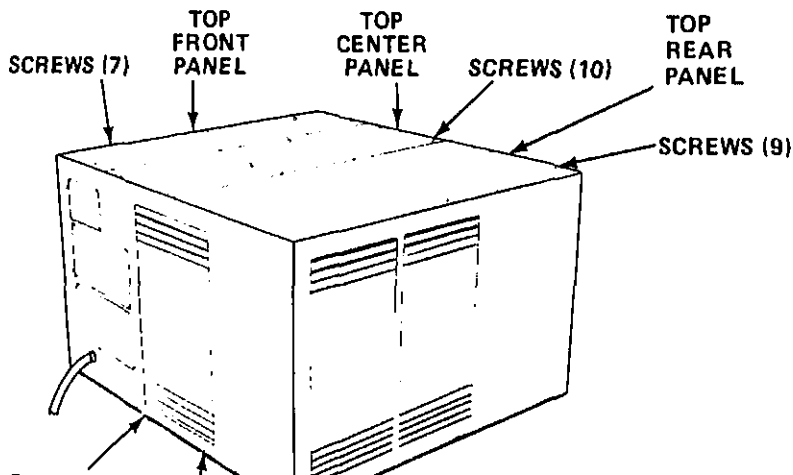


Remove ten (10) screws securing  
top center panel to housing.  
Remove top center panel.

Remove seven (7) screws  
securing top front panel to  
housing. Remove top front  
panel.

Remove nine (9) screws securing  
top rear panel to air  
conditioner housing. Remove  
top rear panel.

Remove seventeen (17) screws  
securing right side panel to  
housing. Remove right side  
panel.



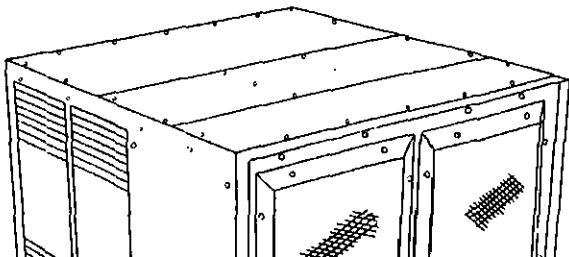
Remove seventeen (17) screws securing left side panel to housing. Remove left side panel.

*Inspect wiring insulation for cracks and frayed material. Pay particular attention to the wires passing through holes in the frame or over rough edges.*

Repair or replace damaged wiring.

Align holes in left side panel with holes in housing. Secure left side panel with seventeen (17) screws.

*Align holes in right side panel with holes in housing. Secure right side panel with seventeen (17) screws.*



Align holes in top front panel with holes in housing. Secure top front panel with seven (7) screws.

Align holes in top center panel with holes in top front and top rear panels. Secure top center panel with ten (10) screws.



air diffuser grill to front panel. Remove air diffuser grill.

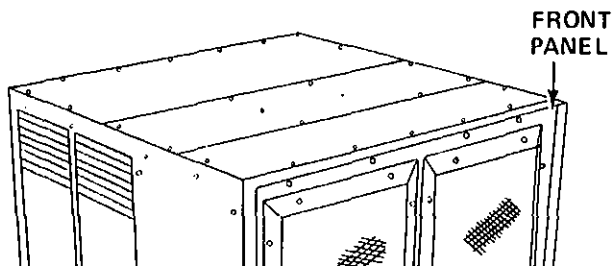
Remove screws (17) securing left side panel to housing. Remove left side panel.

Inspect evaporator coil for cleanliness. Use a stiff bristle brush to remove scale and corrosion from the external portion of the evaporator coil.

Inspect evaporator coil for leaks. Report damaged condition to direct support maintenance personnel.

Align holes in left side panel with holes in housing. Secure left side panel with seventeen (17) screws.

Align holes in air diffuser grill with holes in front panel. Secure air diffuser grill with eight (8) screws.

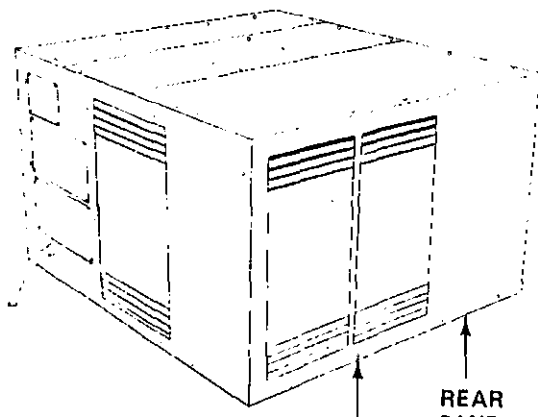


securing rear panel to housing.  
Remove rear panel.

Inspect condenser coil for cleanliness. Use a stiff bristle brush to remove scale and corrosion from the external portion of the condenser coil.

Inspect condenser coil for leaks. Report damaged condition to direct support maintenance personnel.

Align holes in rear panel with holes in housing. Secure rear panel with fourteen (14) screws.



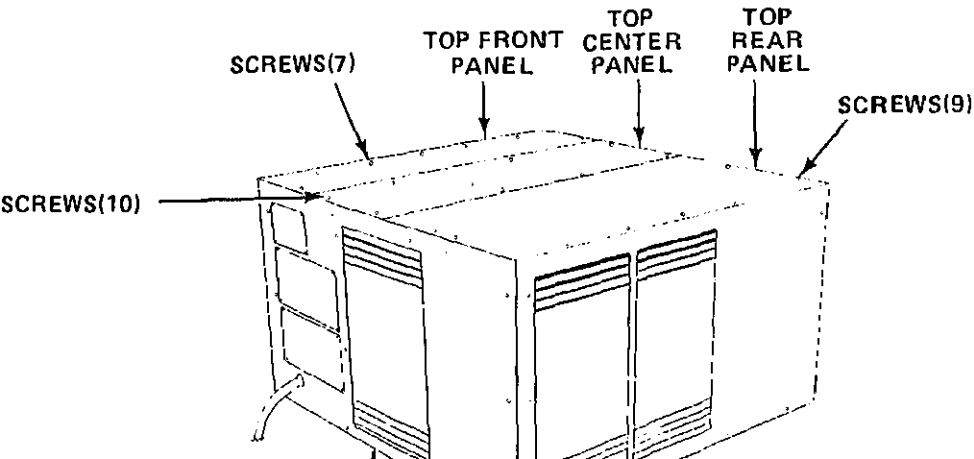
and Refrigerant  
Piping

securing top center panel to  
housing. Remove top center  
panel.

Remove seven (7) screws  
securing top front panel to  
housing. Remove top front  
panel.

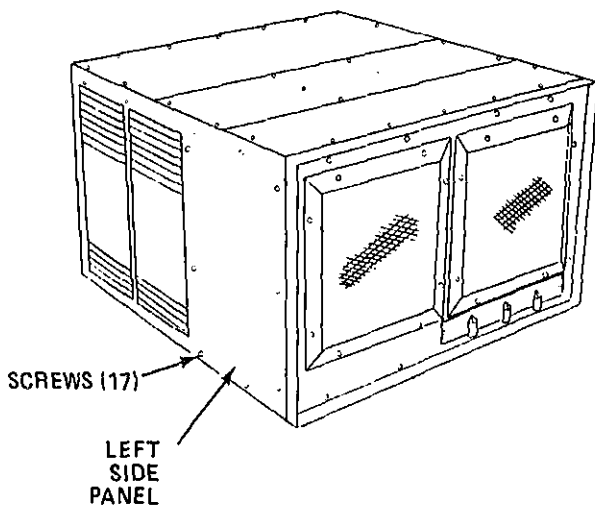
Remove nine (9) screws securing  
top rear panel to air  
conditioner housing. Remove top  
rear panel.

Remove seventeen (17) screws  
securing right side panel to  
housing. Remove right side  
panel.



Expansion Valve  
and Refrigerant  
Piping (continued)

Remove seventeen (17) screws  
securing left side panel to  
housing. Remove left side  
panel.

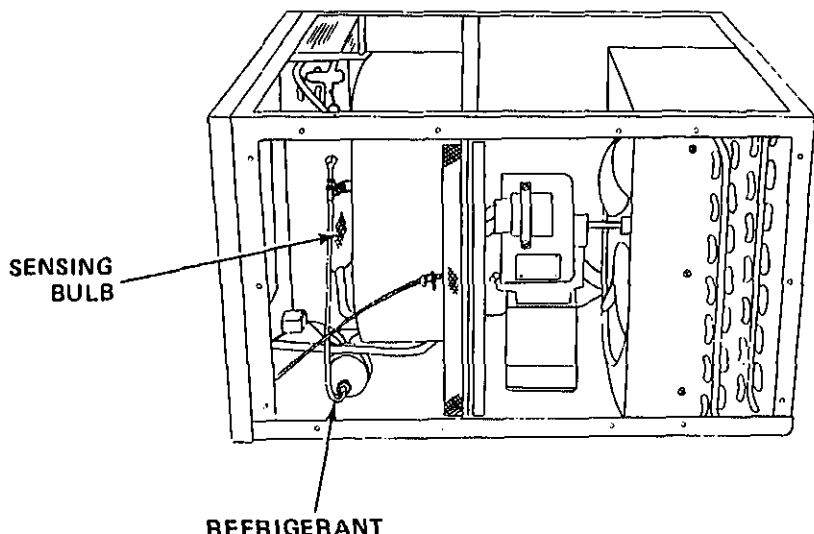


and Refrigerant  
Piping (continued)

for leaks. Repair leaks.

Inspect expansion valve for  
loose or leaking connections.  
Tighten connections.

Check to see that the sensing  
bulb is securely fastened and  
is completely covered with  
insulation tape part number  
165 manufactured by Pressite  
Division, Inmont, Inc., St.  
Louis, MO.



Align holes in right side panel with holes in housing. Secure right side panel with seventeen (17) screws.

Align holes in top rear panel with holes in housing. Secure top rear panel with nine (9) screws.

Align holes in top front panel with holes in housing. Secure top front panel with seven (7) screws.

Align holes in top center panel with holes in top front and top rear panels. Secure top center panel with ten (10) screws.

#### NOTE

The sight glass may be inspected by looking through the louvers in the left side panel. If you cannot see the sight glass through the left side panel, then remove the rear panel.

operating and providing cooling air, inspect sight glass.

Yellow appearance indicates moisture in system and bubbles or milky flow indicate low refrigerant charge.

Report presence of these conditions to direct support maintenance personnel.

Align holes in rear panel with holes in housing. Secure rear panel with fourteen (14) screws.

This manual cannot list all malfunctions that may occur; nor all tests or inspections are listed. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

## ORGANIZATIONAL TROUBLESHOOTING TABLE

Condition	Test or Inspection	Corrective Action
-----------	--------------------	-------------------

### AIR CONDITIONER

#### AIR CONDITIONER FAILS TO OPERATE

- |         |   |
|---------|---|
| Step 1. | Check to see if main power cord is plugged in.<br><b>Connect power cable to receptacle supplying 115 VAC, single phase, 60 Hz power.</b>  |
| Step 2. | Check to see if power receptacle connector is defective.<br><b>Replace defective power receptacle connector (para. 4-29).</b>   |
| Step 3. | Check for loose electrical connections.<br><b>Tighten electrical connections.</b>   |
| Step 4. | Inspect for defective wiring.<br><b>Replace defective wiring. Use identical type wire, consult Appendix F, and correct terminal connections (para. 4-29).</b>   |
| Step 5. | Check the selector switch.<br>a. Observe position of the switch. Be sure switch is NOT in the OFF position.<br>b. Rotate the switch through all operating positions. If the air conditioner does not operate in some but not all operating positions, check for a defective switch with a multimeter.<br><b>Replace defective switch (para.4-23).</b> |

#### INSUFFICIENT COOLING

- |         |  |
|---------|--|
| Step 1. | Inspect sight glass for proper amount of refrigerant (para. 4-34).<br><b>Report condition to direct support maintenance personnel.</b> |
| Step 2. | Check for dirty air filter.<br><b>Clean or replace air filter (para. 4-19).</b>  |
| Step 3. | Inspect evaporator coil for cleanliness.<br><b>Clean evaporator coil (para. 4-32).</b>   |
| Step 4. | Check compressor for proper operation (para. 4-30).<br><b>Report condition to direct support maintenance personnel.</b>                |
| Step 5. | Inspect for closed, bent or stuck louvers in the return air grill.   |



3. Inspect fan motor for wear and damage.  
**Replace damaged fan motor (para. 4-20).**
4. Check to see if compressor is knocking or chattering.  
**Stop air conditioner and report condition to direct support maintenance personnel.**

## FANS

### CIRCULATING FAN FAILS TO OPERATE

1. Check to see if main power cord is plugged in.  
**Connect power cord to receptacle supplying 115 VAC, single phase, 60 Hz power.**
2. Test fan motor for resistance.  
**Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).**
3. Check circulating fan for damage or binding.  
**Relieve binding or replace damaged circulating fan (para. 4-22).**
4. Test fan motor capacitor for continuity, leakage and capacitance.  
**Replace capacitor if damage is indicated (para. 4-25).**

### CONDENSER FAN FAILS TO OPERATE

1. Check to see if main power cord is plugged in.  
**Connect power cord to receptacle supplying 115 VAC, single phase, 60 Hz power.**
2. Test fan motor for resistance.  
**Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).**
3. Check condenser fan for damage or binding.  
**Relieve binding or replace damaged circulating fan (para. 4-21).**
4. Test fan motor capacitor for continuity, leakage and capacitance.  
**Replace capacitor if damage is indicated (para. 4-25).**

## COMPRESSOR

### COMPRESSOR WILL NOT START

1. Check the selector switch.
  - a. Observe position of the switch. Be sure switch is NOT in the OFF positions.
  - b. Place the switch in the COOL position. If the air conditioner will not go to the COOL position, check for a defective switch using a multimeter.  
**Replace defective switch (para. 4-23).**
2. Check the THERMOSTAT.
  - a. Observe position of the THERMOSTAT. Be sure THERMOSTAT

- Report condition to direct support maintenance personnel.  
step 4. Check compressor for proper operation and damage (para. 4-30).  
Report condition to direct support maintenance personnel.

## AIR OUTPUT

### EVAPORATOR AIR OUTPUT VOLUME LOW

- step 1. Inspect return air and air diffuser grills for damage and cleanliness.  
Clean, repair or replace return air and air diffuser grills (para. 4-18).  
step 2. Inspect evaporator coil for damage, ice and cleanliness.  
Clean evaporator coil (para. 4-32). Report damaged condition to direct support maintenance personnel.  
step 3. Inspect circulating fan for security of attachment and damage.  
Tighten setscrews in hub of circulating fan, replace fan if damage is indicated (para. 4-20).  
step 4. Test fan motor for resistance.  
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).

### CONDENSER AIR OUTPUT VOLUME LOW

- step 1. Inspect condenser coil for cleanliness or damage.  
Clean condenser coil (para. 4-33). Report damaged condition to direct support maintenance personnel.  
step 2. Test thermostat for resistance.  
Replace defective thermostat (para. 4-24).  
step 3. Inspect condenser fan for security of attachment and damage.  
Tighten setscrews in hub of condenser fan, replace fan if damage is indicated (para. 4-20).  
step 4. Test fan motor for resistance.  
Consult Appendix F and replace fan motor if damage is indicated (para. 4-20).
-

er	4-19	4-34
ting Fan	4-22	4-48
essor	4-30	4-73
user Coil	4-33	4-83
user Fan	4-21	4-41
ator Coil	4-32	4-80
ion Valve	4-35	4-87
otor	4-20	4-34
l	4-17	4-25
g Panels and Grills	4-18	4-26
Capacitor	4-25	4-61
rant Piping	4-31	4-74
pacitor	4-27	4-65
r Switch	4-23	4-53
lass	4-34	4-85
apacitor	4-26	4-63
elay	4-28	4-67
ostat Switch	4-24	4-57
	4-29	4-70

Information pertains to all procedures for organizational maintenance personnel.

## Configurations

## Special Environmental Conditions

None

## ment

## s

## required

## Organizational Maintenance

## General Safety Instructions

Disconnect the power source before performing any maintenance function. Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

**Material/Parts**

Top Center Panel Screws (10)  
 Top Front Panel Screws (7)  
 Top Rear Panel Screws (9)  
 Right Side Panel Screws (17)  
 Rear Panel Screws (14)  
 Return Air Grill Screws (8)  
 Air Diffuser Grill Screws (8)  
 Control Panel Plate Screws (2)  
 Front Panel Screws (14)  
 Adhesive

**References**

None

**Troubleshooting Reference**

None

**Approximate Time Required (in minutes)**

Removal  
 Repair  
 Installation  
**TOTAL TIME**

**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****TOP AND LEFT SIDE OF HOUSING****1. Top Center Panel**

- a. Remove ten (10) screws securing panel.
- b. Remove top center panel.

**2. Top Front Panel**

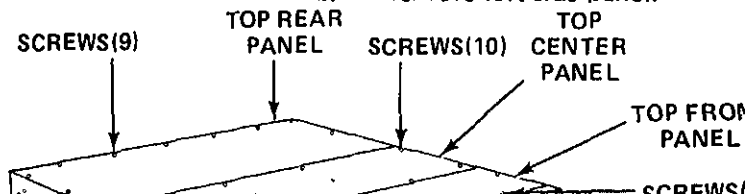
- a. Remove seven (7) screws securing panel.
- b. Remove top front panel.

**3. Top Rear Panel**

- a. Remove nine (9) screws securing panel.
- b. Remove top rear panel.

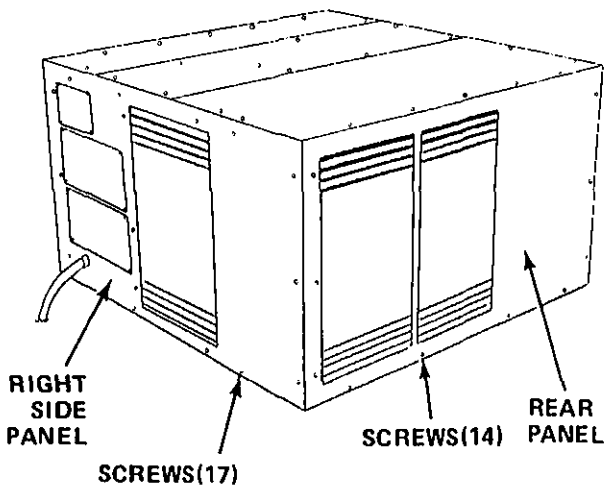
**4. Left Side Panel**

- a. Remove seventeen (17) screws securing side panel.
- b. Remove left side panel.



e Panel

- a. Remove seventeen (17) screws securing side panel.
  - b. Remove right side panel.
- a. Remove fourteen (14) screws securing panel.
  - b. Remove rear panel.



switch to front panel.

- c. Remove front panel.



SCREWS(14)

**SCREWS**

RETURN  
AIR  
GRILL

**- SCREWS**

CONTROL  
PANEL  
PLATE

**FRESH  
AIR  
CONTROL**

## SELECTOR SWITCH

## THERMOSTAT SWITCH

**AIR  
DIFFUSER  
GRILL**

SCREWS(8)

ter Panel

ION

HOUSING

nel

Panel Plate

user Grill

Air Grill

- top front panel.
- c.* Inspect panels for distortion or loose gasket.
- d.* Secure loose gasket with adhesive per specification MMM-A-121.
- e.* Replace gasket with .062 inch thick wood per specification MIL-G-20241. Secure gasket with adhesive per specification MMM-A-

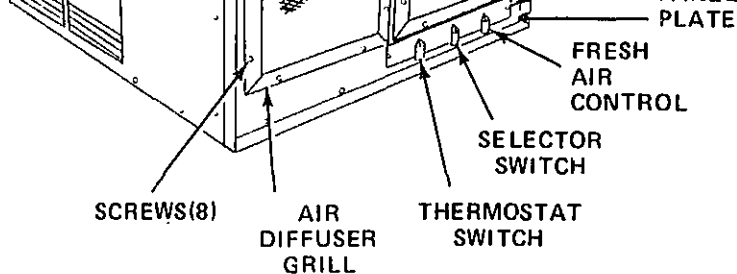
- a.* Inspect panel for distortion.
- b.* Straighten or replace damaged panel.

Repair consists of straightening bent louvers.

- a.* Align holes in thermostat switch with holes in front panel.
- b.* Secure thermostat switch to front panel with two (2) screws.
- c.* Align holes in front panel with holes in housing.
- d.* Secure front panel with fourteen (14) screws.
- a.* Align holes in control panel plate with holes in front panel.
- b.* Secure control panel plate with two screws.
- c.* Install three (3) knobs.

- a.* Align holes in air diffuser grill with holes in front panel.
- b.* Secure air diffuser grill with eight (8) screws.

- a.* Align holes in return air grill with holes in front panel.
- b.* Secure return air grill with eight (8) screws.
- c.* Install wire in mechanical screw post and tighten mechanical screw post.



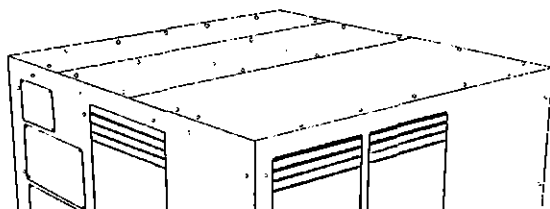
ON/ITEM	REMARKS	ACTION
---------	---------	--------

ON

AND REAR OF HOUSING

Panel

- a. Align holes in rear panel with holes in housing.
- b. Secure rear panel with fourteen (14) screws.
- a. Align holes in right side panel with holes in housing.
- b. Secure right side panel with seventeen (17) screws.





Panel

Panel

r Panel

b. Secure left side panel with seventeen (17) screws.

a. Align holes in top rear panel with holes in housing.

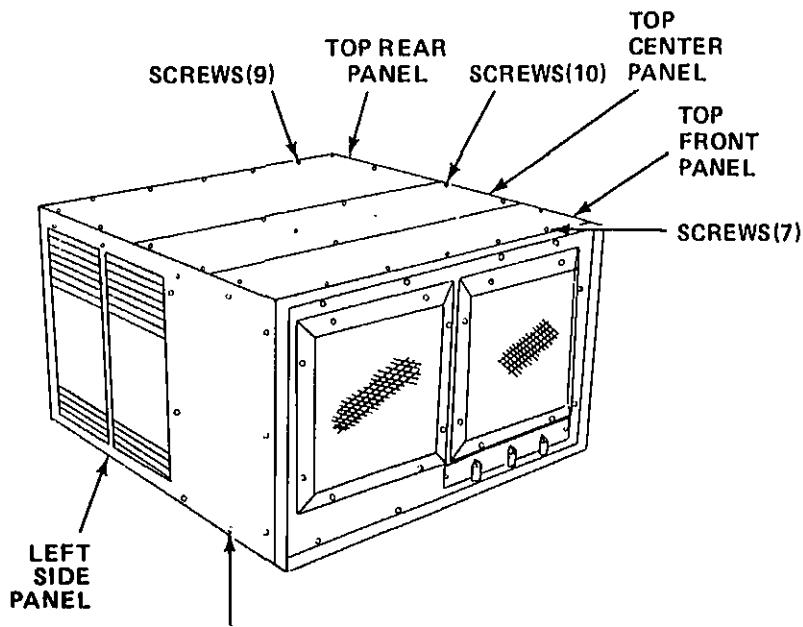
b. Secure top rear panel with nine (9) screws.

a. Align holes in top front panel with holes in housing.

b. Secure top front panel with seven (7) screws.

a. Align holes in top center panel with holes in top front and top rear panels.

b. Secure top center panel with ten (10) screws.



**INITIAL SETUP****Material/Parts**

Air Filter Cover Screws (12)  
 Dry Cleaning Solvent  
 Filterkote or Oil

**References**

None

**Troubleshooting Reference**

AIR CONDITIONER, Malfunction

**Approximate Time Required (in minutes)**

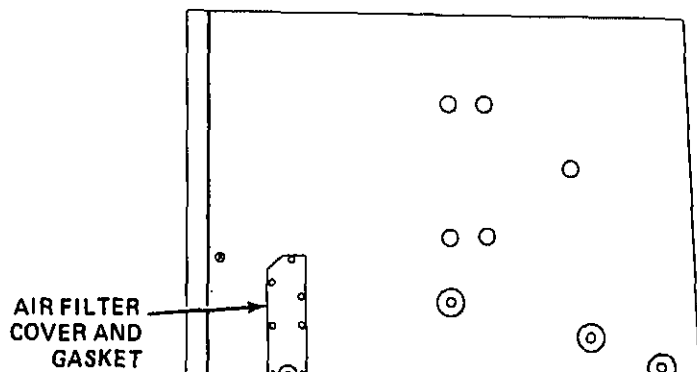
Removal	10
Inspection and Service	10
Installation	10
<b>TOTAL TIME</b>	<b>30</b>

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

**REMOVAL****BOTTOM OF HOUSING**

Air Filter

- Remove twelve (12) screws securing cover to bottom of air conditioner.
- Remove air filter cover and gasket.
- Slide air filter down and out of conditioner.



contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

## WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

- a. Clean air with P-D-680 or P-S-661 cleaning solvent or warm soapy water.
- b. Dry air filter with low pressure compressed air.
- c. Inspect air filter for damaged or clogged condition.
- d. Replace air filter if damage is indicated.
- e. Inspect two (2) rubber pads on bottom of filter for damaged condition.
- f. Replace pads with a 2-inch long piece of rubber in accordance with ASTM D2000-2BG505F17L14.
- g. Secure pads with adhesive per specification MMM-A-121.
- h. Dip or spray air filter with filterkote or oil per specification MIL-L-2104 Grade 20, 30 or better.
- i. Drain off excess oil before installation.

ON

## HOUSING

- a. Slide air filter up into air conditioner.
- b. Install gasket and air filter cover.
- c. Secure air filter cover with twelve (12) screws.

Front Panel Screws (14)  
Blower Intake Ring Screws (7)  
Fan Motor Capscrews (4)  
Fan Motor Self-Locking Nuts (4)  
Thermostat Switch Screws (2)

References  
None

Approximate Time Required (in min)  
Removal  
Inspection and Testing  
Repair  
Installation  
TOTAL TIME

LOCATION/ITEM

REMARKS

ACTION

## REMOVAL

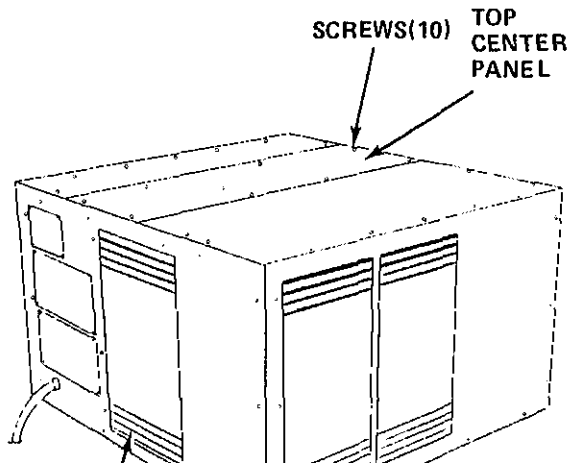
### RIGHT SIDE AND TOP OF HOUSING

1. Right Side Panel

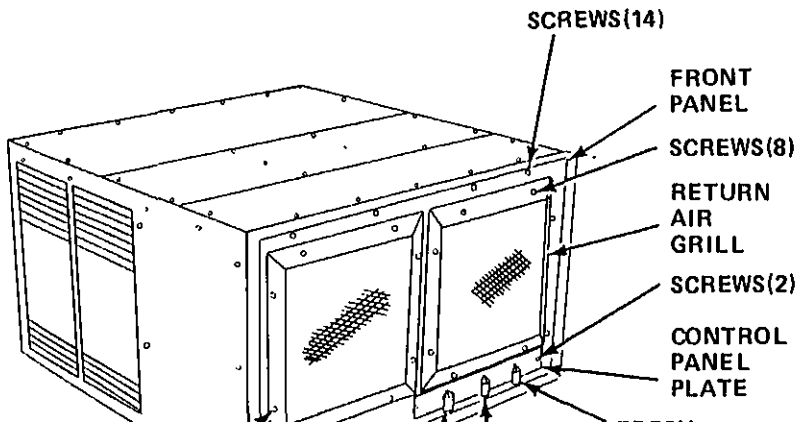
- a. Remove seventeen (17) screws from right side panel.
- b. Remove right side panel.

2. Top Center Panel

- a. Remove ten (10) screws from top center panel.
- b. Remove top center panel.

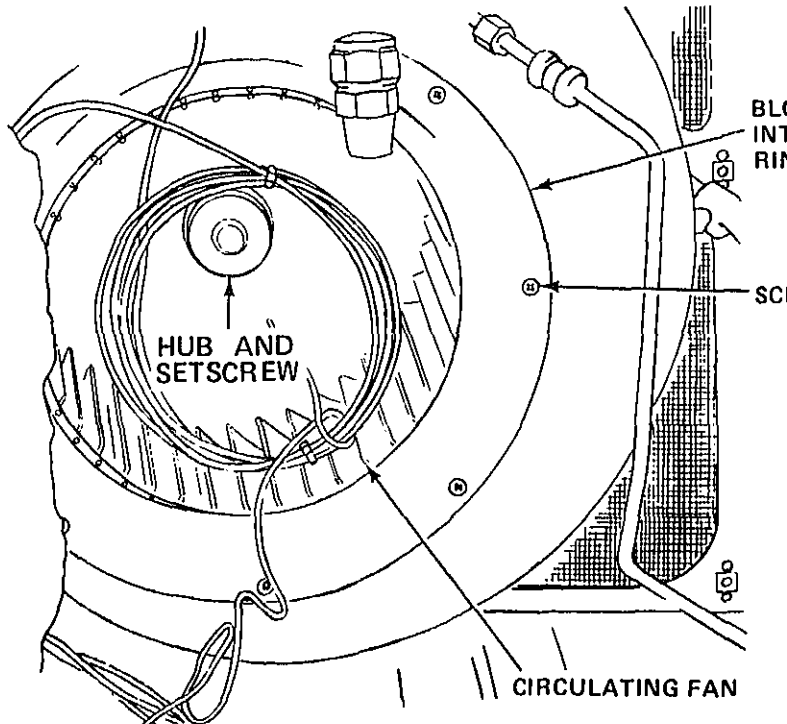


- Return air grill and remove wire.
- b. Remove eight (8) screws securing return air grill.
  - c. Remove return air grill.
- a. Remove eight (8) screws securing air diffuser grill.
  - b. Remove air diffuser grill.
- a. Loosen setscrews and remove knobs from fresh air control, selector switch and thermostat switch.
  - b. Remove two (2) screws securing control panel plate.
  - c. Remove control panel plate.
- a. Remove two (2) screws securing thermostat switch to front panel.
  - b. Remove fourteen (14) screws securing front panel.
  - c. Remove front panel.



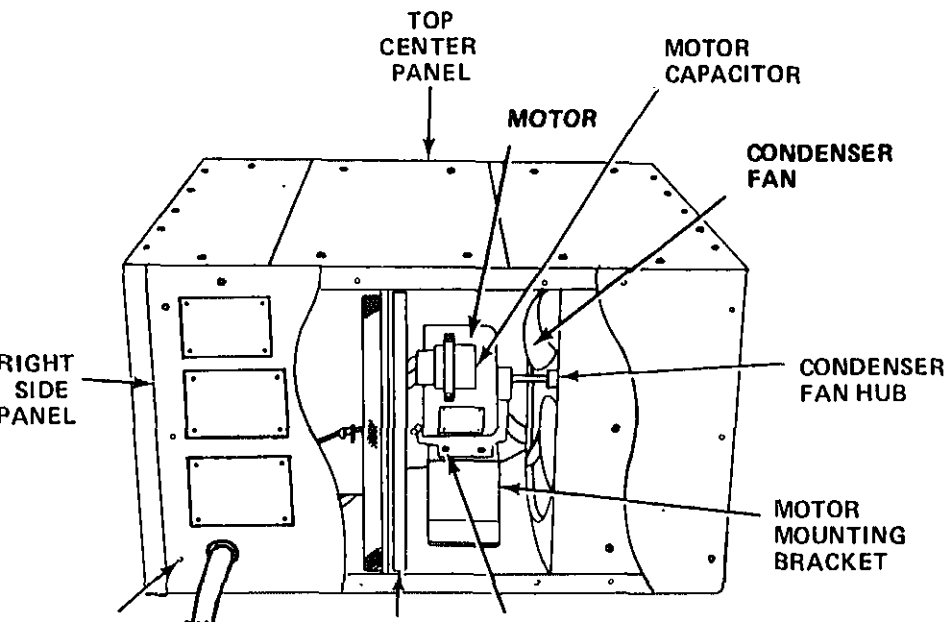
## 8. Circulating Fan

- a. Loosen setscrew in hub of circ.
- b. Carefully remove circulating



death or serious injury may occur if capacitor is not discharged prior to removal.

- a. Remove upper four (4) capscrews and self-locking nuts securing motor to motor mounting bracket.
- b. Slide motor back against bulkhead.
- c. Loosen setscrew in hub of condenser fan.
- d. Remove condenser fan.
- e. Discharge motor capacitor.
- f. Tag and disconnect electrical leads to motor capacitor.
- g. Tag and disconnect leads to fan motor.
- h. Remove fan motor from housing.



## REPAIR

### 11. Fan Motor

Repair electrical wiring as follows:

- (1) Remove insulation to bare wire on each side.
- (2) Twist the wire ends in the splice.
- (3) Cover the splice with tape, making certain to seal areas.

## INSTALLATION

### 12. Fan Motor

- a. Connect electrical leads to fan and remove tags.
- b. Connect electrical leads to fan and remove tags.
- c. Place fan motor on motor.
- d. Slide fan motor back against fan.

## INSTALLATION

### RIGHT SIDE OF HOUSING

### 13. Condenser Fan

- a. Install condenser fan on fan.
- b. Tighten setscrew in condenser fan.

### FRONT OF HOUSING

### 14. Circulating Fan

- a. Carefully install circulating fan on shaft.
- b. Tighten setscrew in circulating fan.

### 15. Blower Intake Ring

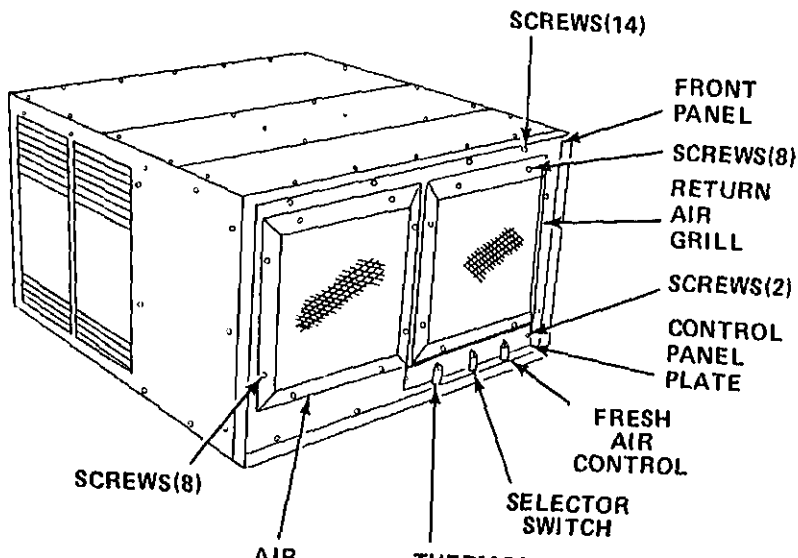
- a. Align holes in blower intake ring with circulating fan housing.
- b. Secure blower intake ring with screws.

### 16. Front Panel

- a. Align holes in thermostat switch with front panel.
- b. Secure thermostat switch with screws.

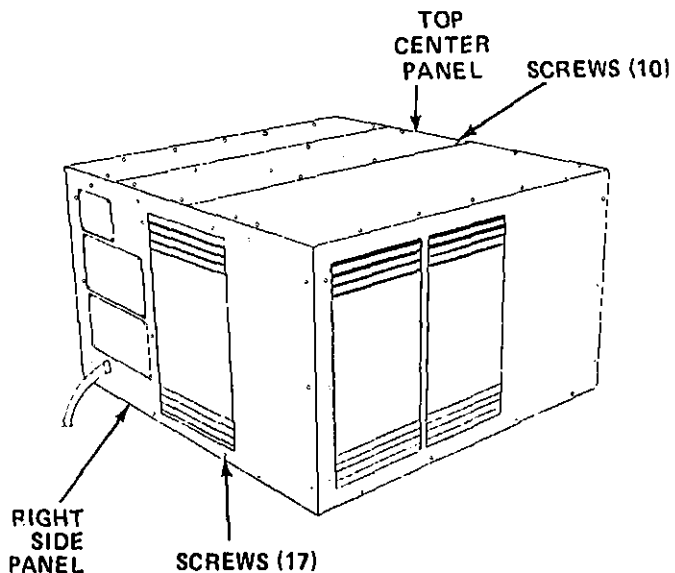


- a. Align holes in control panel plate with holes in front panel.
  - b. Secure control panel plate with two (2) screws.
  - c. Install three (3) knobs on fresh air control, selector switch, and thermostat switch.
- 
- a. Align holes in air diffuser grill with holes in front panel.
  - b. Secure air diffuser grill with eight (8) screws.
- 
- a. Align holes in return air grill with holes in front panel.
  - b. Secure return air grill with eight (8) screws.
  - c. Install wire in mechanical screw post and tighten mechanical screw post.



## 21. Right Side Panel

- b. Secure top center panel.
- a. Align holes in right housing.
- b. Secure right side panel screws.



# Troubleshooting Reference

Side Panel Screws (17)

Center Panel Screws (10)

Air Grill Screws (8)

User Grill Screws (8)

Panel Plate Screws (2)

Panel Screws (14)

Intake Ring Screws (7)

Door Capscrews (4)

Door Self-Locking Nuts (4)

Stat Switch Screws (2)

FANS, Malfunction 1, Step 3

AIR OUTPUT, Malfunction 2, Step 3

NOISE, Malfunction 1, Step 2

## Approximate Time Required (in minutes)

Removal 30

Inspection and Repair 20

Installation 30

TOTAL TIME 80

ITEM

REMARKS

ACTION

## TO TOP OF HOUSING

el

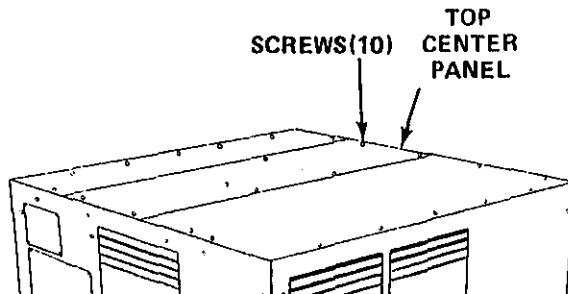
*a.* Remove seventeen (17) screws securing right side panel.

*b.* Remove right side panel.

nel

*a.* Remove ten (10) screws securing top center panel.

*b.* Remove top center panel.



# IT OF HOUSING

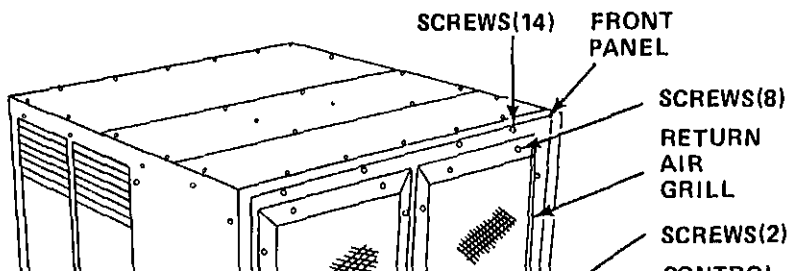
turn Air Grill

Diffuser Grill

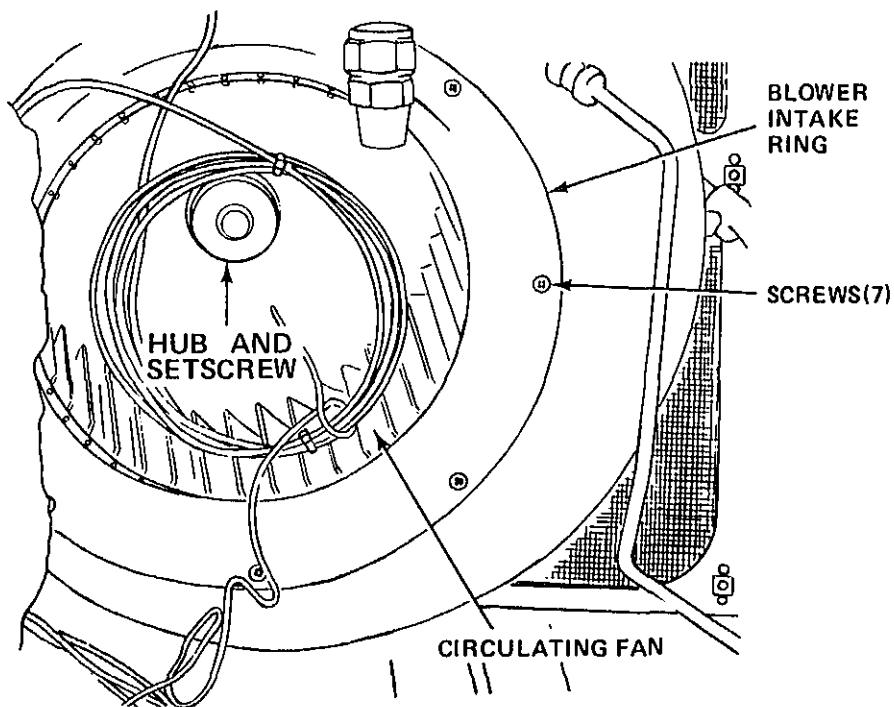
ontrol Panel Plate

ont Panel

- a. Loosen mechanical screw post at return air grill and remove wire.
  - b. Remove eight (8) screws securing return air grill.
  - c. Remove return air grill.
- 
- a. Remove eight (8) screws securing air diffuser grill.
  - b. Remove air diffuser grill.
- 
- a. Loosen setscrews and remove knob from fresh air control, selector switch and thermostat switch.
  - b. Remove two (2) screws securing control panel plate.
  - c. Remove control panel plate.
- 
- a. Remove two (2) screws securing thermostat switch to front panel.
  - b. Remove fourteen (14) screws securing front panel.
  - c. Remove front panel.



- a. Loosen setscrew in hub of circulating fan.  
b. Carefully remove circulating fan.

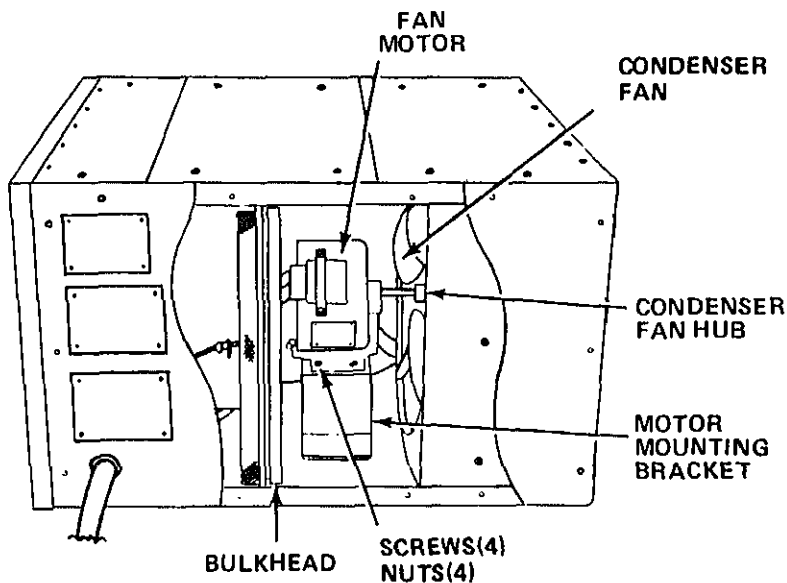


## ALLATION

### Condenser Fan

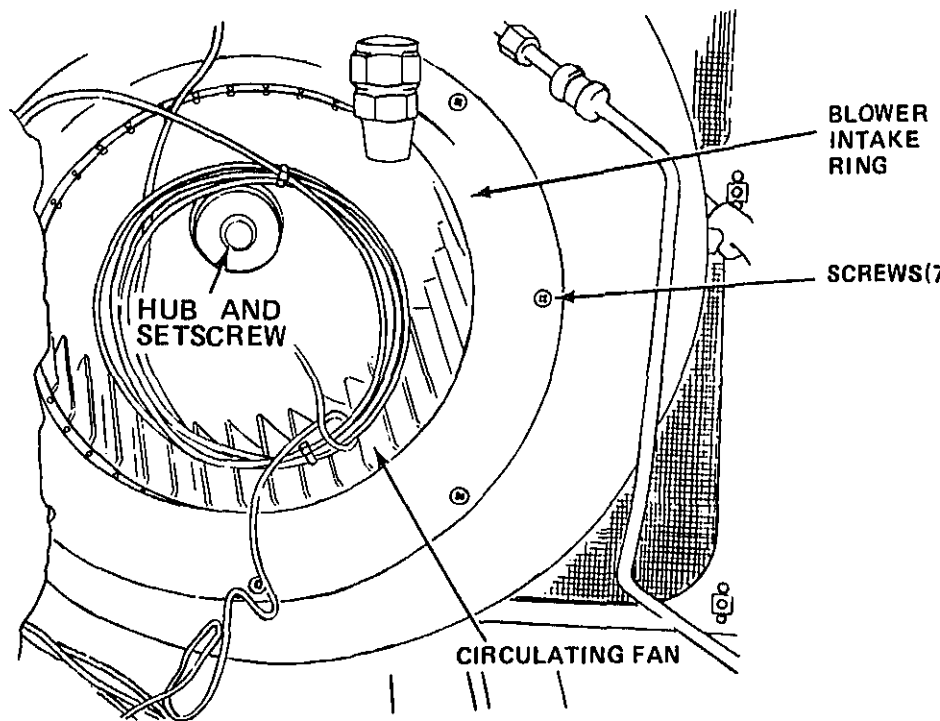
- c. Replace setscrew with a 1/4-28U  
.312 inch long setscrew if damage is

- a. Install condenser fan on fan motor sl  
b. Tighten setscrew in condenser fan hu  
c. Slide fan motor back into place o  
mounting bracket.  
d. Secure fan motor to motor mounting  
with four (4) capscrews and self-lo



wer Intake Ring

- a. Align holes in blower intake ring with circulating fan housing.
- b. Secure blower intake ring with screws.



- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in front panel with housing.
- d. Secure front panel with fourteen (14) screws.

### Control Panel Plate

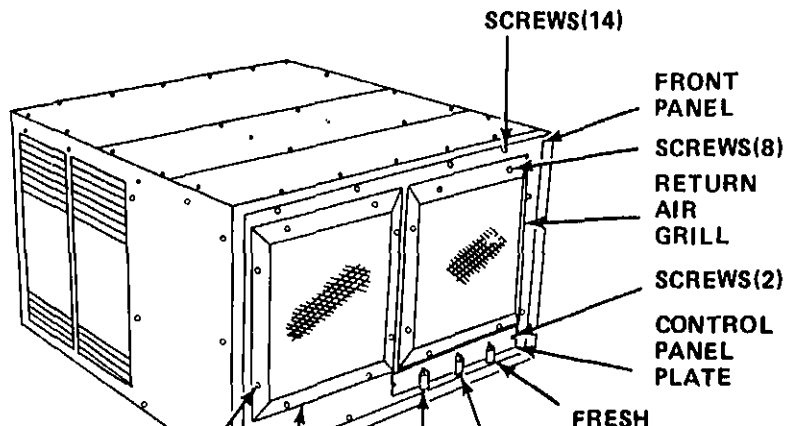
- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two (2) screws.
- c. Install three (3) knobs on fresh air selector switch and thermostat switch.

### Air Diffuser Grill

- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.

### Return Air Grill

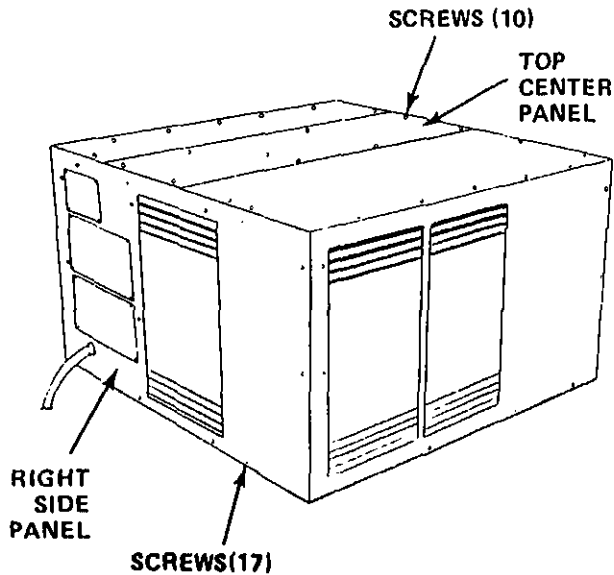
- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post, tighten mechanical screw post.





Right Side Panel and:

- a. Tighten screws in right side panel to secure housing.
- b. Secure right side panel with several screws.



Top Section Panel Screws (15)  
 Return Air Grill Screws (8)  
 Air Diffuser Grill Screws (8)  
 Control Panel Plate Screws (8)  
 Front Panel Screws (14)  
 Blower Intake Ring Screws (7)  
 Fan Motor Capscrews (4)  
 Fan Motor Self-Locking Nuts (4)  
 Thermostat Switch Screws (2)

#### References

None

AIR OUTPUT, Malfunction 1, Step 1  
 NOISE, Malfunction 1, Step 1

#### Approximate Time Required (in min)

Removal	3
Inspection and Repair	2
Installation	3
TOTAL TIME	8

#### LOCATION/ITEM

#### REMARKS

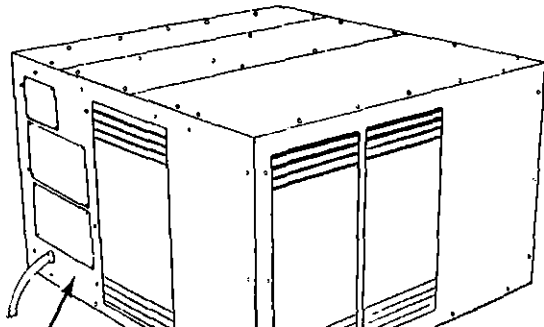
#### ACTION

### REMOVAL

#### RIGHT SIDE OF HOUSING

1. Right Side Panel

- a. Remove seventeen (17) screws from right side panel.
- b. Remove right side panel.

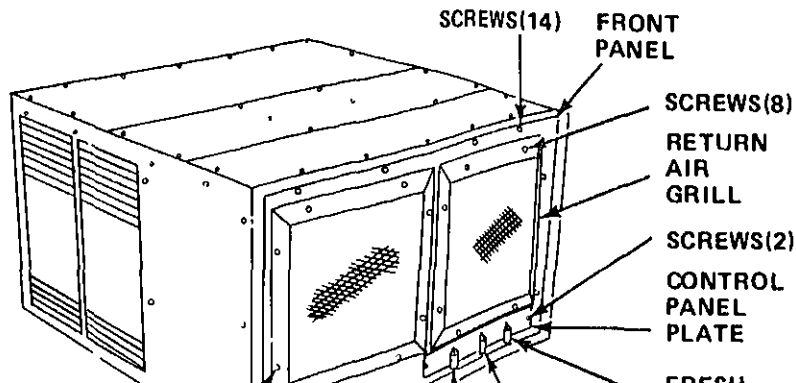


ser Grill

anel Plate

nel

- b. Remove eight (8) screws securing return grill.
- c. Remove return air grill.
- a. Remove eight (8) screws securing air diffuser grill.
- b. Remove air diffuser grill.
- a. Loosen setscrews and remove knobs from fresh air control, selector switch and thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.
- a. Remove two (2) screws securing thermostat switch to front panel.
- b. Remove fourteen (14) screws securing front panel.
- c. Remove front panel.



Circulating Fan

## INSPECTION AND REPAIR

Circulating Fan

- a. Loosen setscrew in hub of circulating fan.
- b. Carefully remove circulating fan.

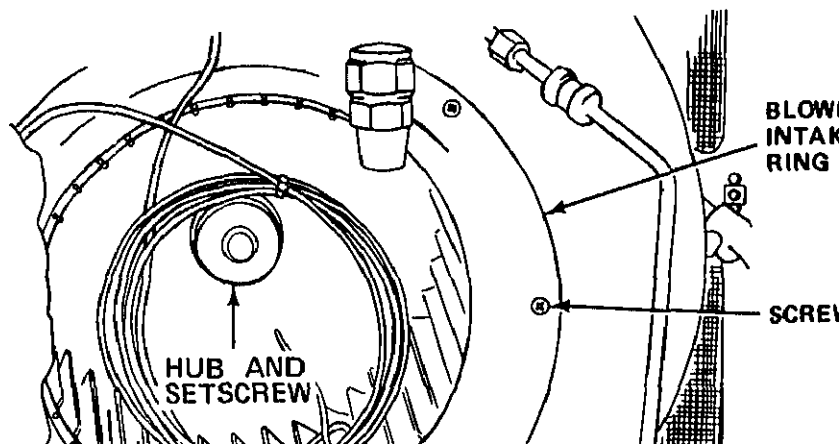
## INSTALLATION

Circulating Fan

- a. Inspect circulating fan, hub and shaft for any indication of excessive wear or damage.
- b. Replace circulating fan if damage to fan or circulating fan is indicated.
- c. Replace setscrew with a 1/4-20 x 1/2 inch long setscrew if damaged.

Blower Intake Ring

- a. Carefully install circulating fan on shaft.
  - b. Tighten setscrew in circulating fan.
- a. Align holes in blower intake ring with holes in circulating fan housing.
  - b. Secure blower intake ring with screws.



Panel

- c. Align holes in thermostat switch with holes in front panel.
- d. Secure thermostat switch to front panel with two (2) screws.
- e. Align holes in front panel with hole in housing.
- f. Secure front panel with fourteen (14) screws.

## Panel Plate

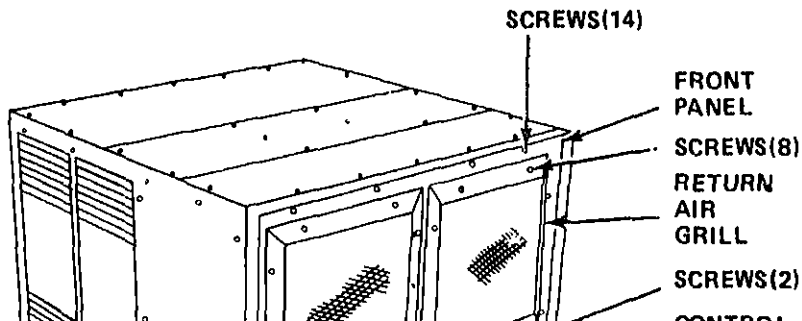
- a. Align holes in control panel plate with holes in front panel.
- b. Secure control panel plate with two screws.
- c. Install three (3) knobs on fresh air control selector switch and thermostat switch.

## Air Diffuser Grill

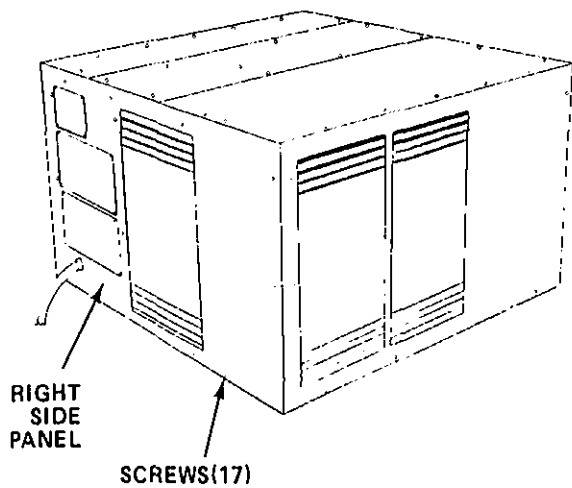
- a. Align holes in air diffuser grill with holes in front panel.
- b. Secure air diffuser grill with eight (8) screws.

## Return Air Grill

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post to tighten mechanical screw post.



- b. housing.  
Secure right side panel with screws.



## INITIAL SETUP

### Material/Parts

- Right Side Panel Screws (17)
- Control Panel Plate Screws (2)
- Selector Switch Screws (2)
- Return Air Grill Screws (8)

### References

Appendix F, Wiring Diagram

### Troubleshooting Reference

AIR CONDITIONER, Malfu

### Approximate Time Required (in r

Removal

Test

Installation

TOTAL TIME

## LOCATION/ITEM

## REMARKS

## ACTION

### REMOVAL

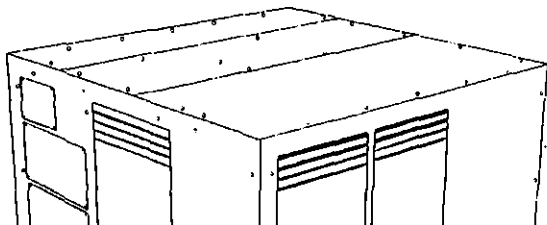
### RIGHT SIDE OF HOUSING

#### 1. Right Side Panel

- a.* Remove seventeen (17) screws from the right side panel.
- b.* Remove right side panel.

### NOTE

The selector switch may be tested while installed in the air conditioner. To gain access to the selector switch, remove the right side panel.



# WIRING

## Selector Switch

- a. Loosen set screws and remove three screws.
- b. Remove two (2) screws securing control plate to front panel.
- c. Remove control panel plate.
- d. Tag and disconnect electrical leads from selector switch.
- e. Remove two (2) screws securing selector switch to front panel.
- f. Remove selector switch.

- a. Tag and disconnect electrical leads from selector switch.
- b. Using an ohmmeter, measure resistance between the related contacts at each setting as follows (see Wiring Diagram, Appendix F):
  - (1) With selector switch in "OFF" position, resistance should be high.
  - (2) With selector switch in "ON" position, high resistance should be indicated at the compressor terminals. Low resistance should be indicated at the fan terminal.
  - (3) With selector switch in "TEST" position, low resistance should be indicated.
- c. Replace selector switch if testing indicates that it is defective.

# INSTALLATION

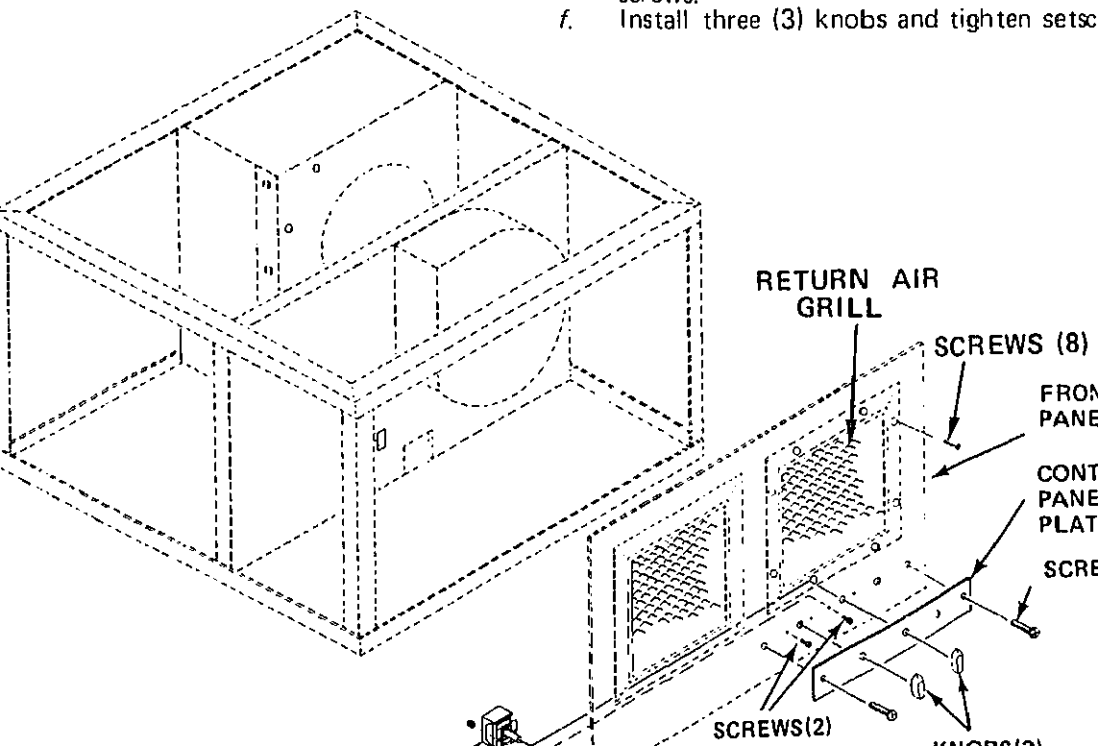
## INSTALLATION OF HOUSING

## Selector Switch

- a. Connect electrical leads to selector switch and remove tags.
- b. Align holes in selector switch with holes in front panel.
- c. Secure selector switch with two (2) screws.
- d. Align holes in control panel plate with holes in front panel.

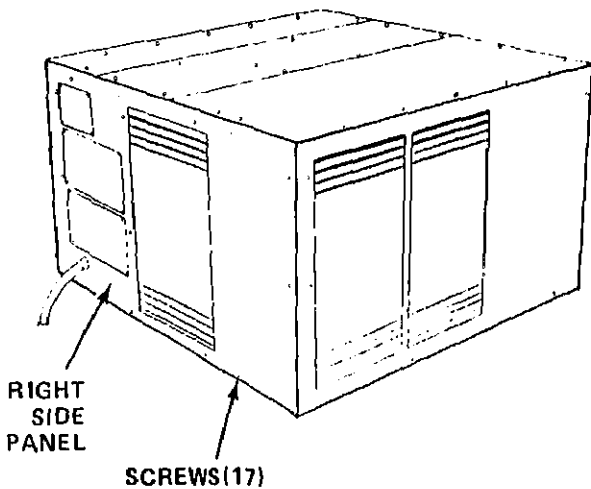


- front panel.
- b.* Secure return air grill to front panel with eight (8) screws.
- a.* Connect electrical leads to selector switch and remove tags.
- b.* Align holes in selector switch with holes in front panel.
- c.* Secure selector switch with two (2) screws.
- d.* Align holes in control panel plate with holes in front panel.
- e.* Secure control panel plate with two screws.
- f.* Install three (3) knobs and tighten setscrews.



**INSTALLATION****RIGHT SIDE OF HOUSING****7. Right Side Panel**

- a. Align holes in right side panel with housing.
- b. Secure right side panel with screws.



**SETUP****Material/Parts**

- Right Side Panel Screws (17)
- Control Panel Plate Screws (2)
- Thermostat Switch Screws (2)
- Return Air Grill Screws (8)

**References**

Appendix F, Wiring Diagram

**Troubleshooting Reference**

AIR OUTPUT, Malfunction 2, Step 2

**Approximate Time Required (in minutes)**

Removal	10
Test	10
Installation	10
<b>TOTAL TIME</b>	<b>30</b>

**LOCATION/ITEM****REMARKS****ACTION**

**VAL**

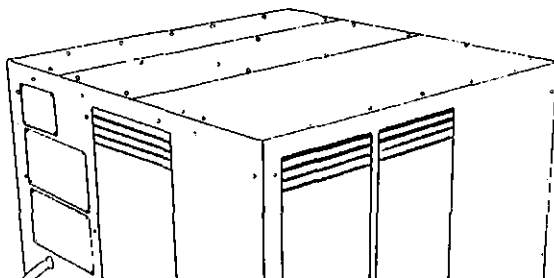
**SIDE OF HOUSING**

Right Side Panel

- a. Remove seventeen (17) screws securing right side panel.
- b. Remove right side panel.

**NOTE**

The thermostat switch may be tested while installed in the air conditioner. To gain access to the selector switch, remove the right side panel.



Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line. Use care to prevent damage to sensing bulb.

Thermostat Switch

- a. Loosen setscrews and remove three (3) screws securing control panel plate to front panel.
- b. Remove control panel plate.
- c. Tag and disconnect electrical lead to thermostat switch.
- d. Remove two (2) screws securing the switch to front panel.
- e. Unwrap thermostat switch sensing bulb and remove thermostat switch.

## TESTING

Thermostat Switch

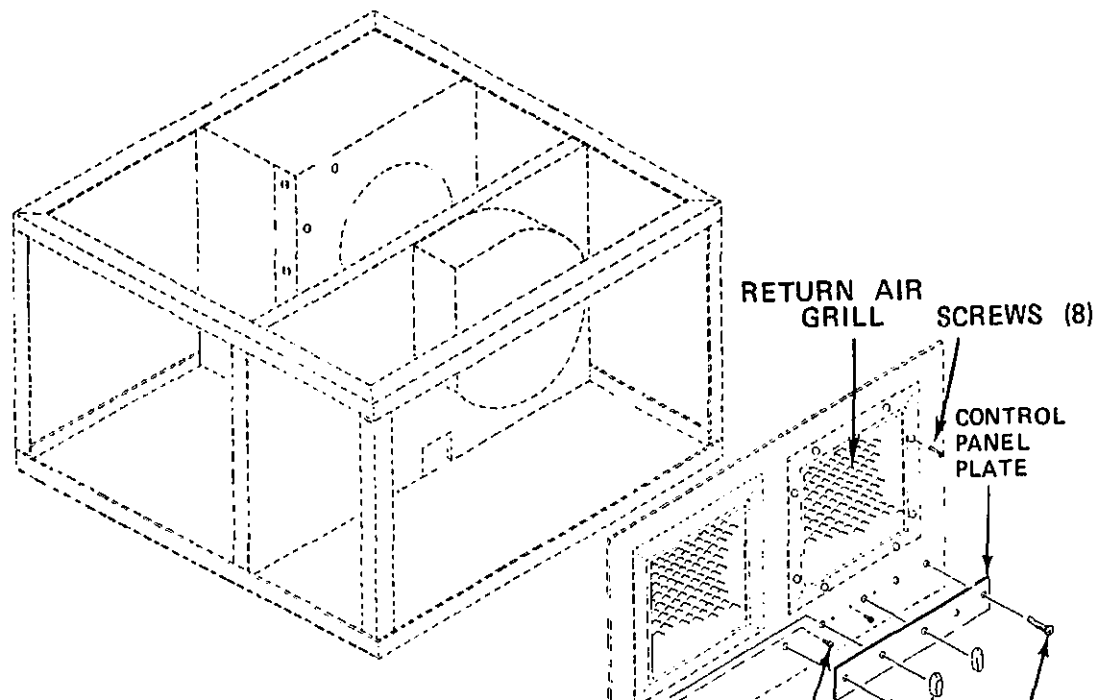
- a. Tag and disconnect electrical lead to thermostat switch.
- b. With the thermostat switch set below room temperature, use an ohmmeter and resistance wire to check for continuity across the thermostat terminals (see Wiring Diagram, Appendix A).
- c. Verify that the resistance indicated is less than 100 ohms.
- d. Move thermostat switch setting to a position above room temperature.
- e. Verify that the resistance is infinity.
- f. Replace thermostat switch if testing indicates that it is defective.

## INSTALLATION

Thermostat Switch

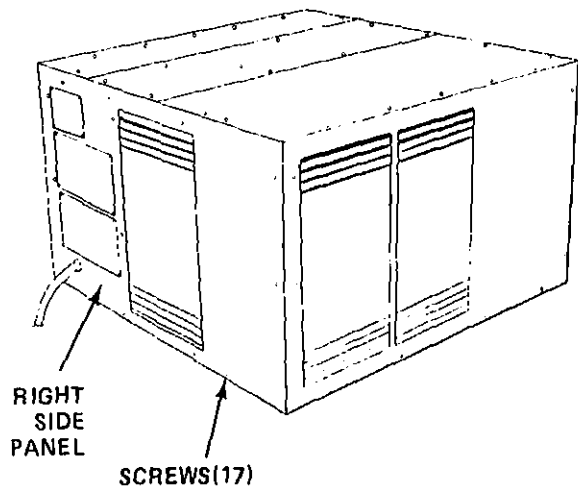
- a. Connect electrical leads to thermostat switch and remove tags.
- b. Align holes in thermostat switch with holes in front panel.
- c. Secure thermostat switch with two (2) screws.

- front panel.
- b. Secure return air grill to front panel with eight (8) screws.
  - a. Connect electrical leads to thermostat switch and remove tags.
  - b. Align holes in thermostat switch with holes in front panel.
  - c. Secure thermostat switch with two (2) screws.
  - d. Align holes in control panel plate with holes in front panel.
  - e. Secure control panel plate with two (2) screws.
  - f. Install three (3) knobs and tighten setscrews.



7. Right Side Panel

- a. Align holes in right side panel housing.
- b. Secure right side panel with screws.



**Material/Parts**  
Right Side Panel Screws (17)  
Capacitor Bracket Screws (2)

**Troubleshooting Reference**  
FANS, Malfunction 1, Step 4

**References**  
None

**Approximate Time Required (in min)**  
Removal 1  
Testing  
Installation 1  
TOTAL TIME 2

**LOCATION/ITEM**

**REMARKS**

**ACTION**

## REMOVAL

### RIGHT SIDE OF HOUSING

1. Right Side Panel

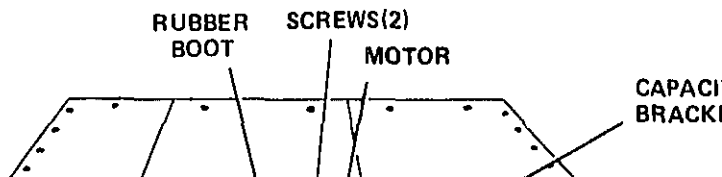
- Remove seventeen (17) screws from right side panel.
- Remove right side panel.

## WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

2. Motor Capacitor

- Discharge motor capacitor.
- Slide rubber boot on motor capacitor to gain access to terminals.
- Tag and disconnect electrical wires from motor capacitor.
- Remove two (2) screws securing capacitor bracket to motor.
- Remove capacitor bracket from motor.



LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## TESTING

### RIGHT SIDE OF HOUSING

Motor Capacitor

- Test motor capacitor with a suitable capacitor tester for continuity, leakage short circuit capacitance.
- The motor capacitor is rated at 3 microfarads 370 volts.
- Replace motor capacitor if testing indicates that it is defective.

## INSTALLATION

Motor Capacitor

- Install motor capacitor in capacitor bracket.
- Align holes in capacitor bracket and motor capacitor.
- Secure capacitor bracket with two (2) screws.
- Connect electrical leads to motor capacitor and remove tags.
- Cover electrical leads with rubber boot.

Right Side Panel

- Align holes in right side panel with housing.
- Secure right side panel with seventeen screws.



Material/Parts  
Left Side Panel Screws (17)

Troubleshooting Reference  
None

References  
None

Approximate Time Required (in min)  
Removal  
Testing  
Installation  
TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## REMOVAL

### LEFT SIDE OF HOUSING

1. Left Side Panel

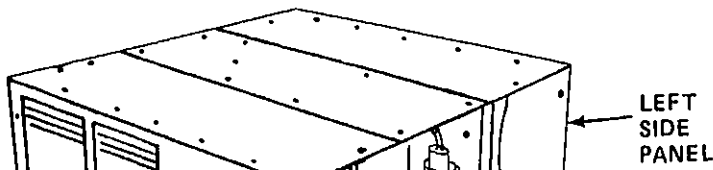
- a. Remove seventeen (17) screw side panel to housing.
- b. Remove left side panel.

## WARNING

Death or serious injury may occur if capacitor is not discharged prior to removal.

2. Start Capacitor

- a. Pull start capacitor from bracket.
- b. Remove cap from start capacitor.
- c. Discharge start capacitor.
- d. Tag and disconnect electrical lead from start capacitor.



LOCATION/ITEM

REMARKS

ACTION

## TESTING

### LEFT SIDE OF HOUSING

3. Start Capacitor

- a.* Test start capacitor with a suitable tester for continuity, leakage capacitance.
- b.* The start capacitor is rated microfarads, 125 volts AC.
- c.* Replace start capacitor if testing that it is defective.

## INSTALLATION

4. Start Capacitor

- a.* Connect electrical leads to start capacitor

**Material/Parts**

Left Side Panel Screws (17)

**Troubleshooting Reference**

None

**References**

None

**Approximate Time Required (in minutes)**

Removal

Testing

Installation

TOTAL TIME

**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****LEFT SIDE OF HOUSING****1. Left Side Panel**

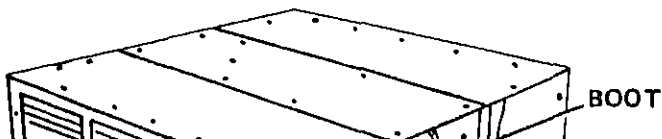
- a.* Remove seventeen (17) screws from left side panel to housing.
- b.* Remove left side panel.

**WARNING**

Death or serious injury may occur if capacitor is not discharged prior to removal.

**2. Run Capacitor**

- a.* Discharge run capacitor.
- b.* Remove cap from run capacitor.
- c.* Tag and disconnect electrical run capacitor.
- d.* Loosen capacitor bracket screws.
- e.* Remove run capacitor from capacitor bracket.



LOCATION/ITEM	REMARKS	ACTION
<b>TESTING</b>		
LEFT SIDE OF HOUSING		
c. Run Capacitor	<ul style="list-style-type: none"> <li>a. Test run capacitor with a suitable tester for continuity, leakage and capacitance.</li> <li>b. The run capacitor is rated at 7.5 mfd 370 volts.</li> <li>c. Replace run capacitor if testing indicates it is defective.</li> </ul>	
<b>INSTALLATION</b>		

## 2. SETUP

### Material/Parts

- Top Center Panel Screws (10)
- Top Rear Panel Screws (10)
- Start Relay Screw (1)
- Start Relay Nut (1)

### References

None

### Troubleshooting Reference

COMPRESSOR, Malfunction 1, Step

### Approximate Time Required (in minutes)

Removal	15
Testing	10
Installation	15
TOTAL TIME	40

### LOCATION/ITEM

### REMARKS

### ACTION

VAL

### F HOUSING

Center Panel

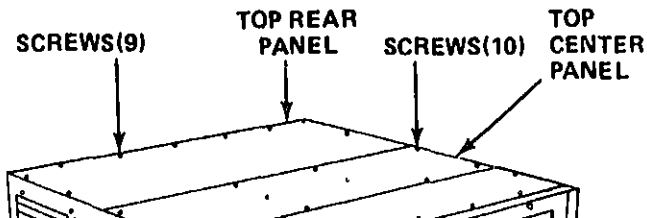
- Remove ten (10) screws securing to panel to housing.
- Remove top center panel.

Rear Panel

- Remove nine (9) screws securing panel to housing.
- Remove top rear panel.

### NOTE

The start relay may be tested while installed in the air conditioner. To gain access to the start relay, remove the top center and top rear panels.



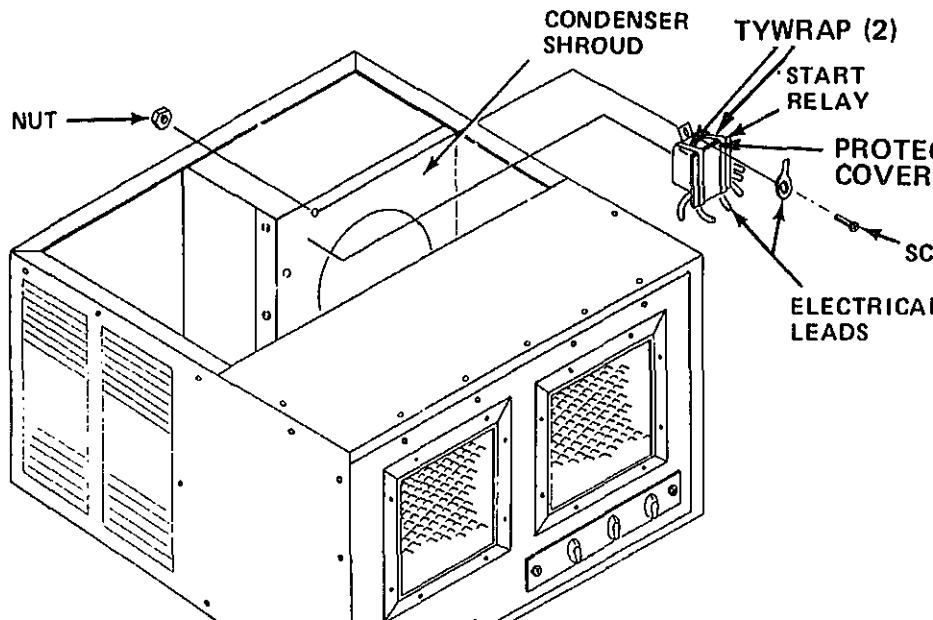
## Start Relay

- Slip two (2) tywraps from around start relay.
- Remove protective cover.
- Tag and disconnect electrical leads from start relay.
- Remove one (1) screw and self-locking nut securing start relay to condenser shroud.
- Remove electrical lead and start relay.

## TESTING

## Start Relay

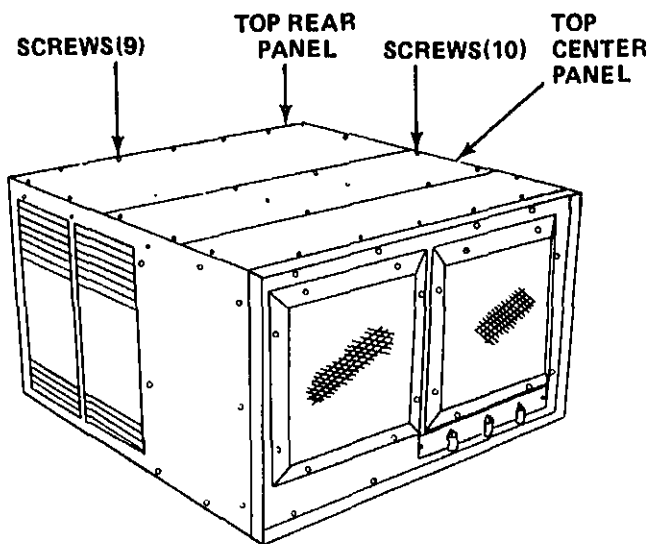
- Tag and disconnect electrical leads from start relay.
- Using an ohmmeter, measure resistance across start relay terminals.
- Replace start relay if there is NO continuity.



Panel

r Panel

- a. Connect electrical leads to start relay, remove tags.
  - b. Align hole in start relay with hole in condenser shroud.
  - c. Secure electrical lead and start relay with (1) screw and self-locking nut.
  - d. Replace protective cover and secure with (2) tywraps.
- 
- a. Align holes in top rear panel and housing.
  - b. Secure top rear panel with nine (9) screws.
- 
- a. Align holes in top center panel with holes in top rear and top front panels.
  - b. Secure top center panel with ten (10) screws.



## INITIAL SETUP

### Material/Parts

- Top Center Panel Screws (10)
- Top Front Panel Screws (7)
- Top Rear Panel Screws (9)
- Right Side Panel Screws (17)
- Left Side Panel Screws (17)

### References

Appendix F, Wiring Diagram

### Troubleshooting Reference

COMPRESSOR, Malfunction 1, Step

### Approximate Time Required (in minutes)

Removal	30
Inspection and Testing	30
Repair	30
Installation	30
TOTAL TIME	120

## LOCATION/ITEM

## REMARKS

## ACTION

### REMOVAL

#### TOP AND RIGHT SIDE OF HOUSING

1. Top Center Panel

- Remove ten (10) screws securing panel.
- Remove top center panel.

2. Top Front Panel

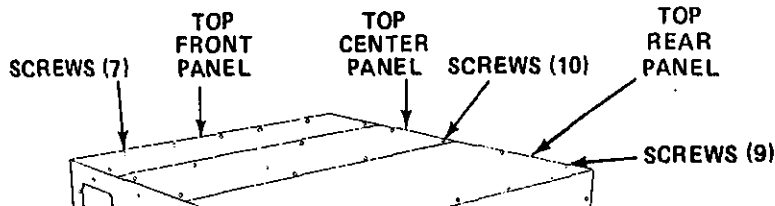
- Remove seven (7) screws securing panel.
- Remove top front panel.

3. Top Rear Panel

- Remove nine (9) screws securing panel.
- Remove top rear panel.

4. Right Side Panel

- Remove seventeen (17) screws securing side panel.
- Remove right side panel.





## ION AND TESTING

### G INTERIOR

#### cal Leads

- a. Inspect all electrical leads for cracked or frayed insulation material.
- b. Inspect all terminals for damaged or missing insulation.
- c. Disconnect each end of the electrical leads and using a multimeter on a low ohms scale, touch probes to each end of the electrical lead and verify that there is continuity (see Wiring Diagram, Appendix B)
  - (1) K1-2 ..... B1-2
  - (2) K1-5 ..... B1-5
  - (3) K1-1 ..... B1-1
  - (4) K1-4 ..... B1-4
  - (5) K1-4 ..... B1-4
  - (6) S1-2 ..... B1-2
  - (7) S2-2 ..... B1-2
  - (8) K1-2 ..... B1-2
  - (9) C2 ..... B1-2
- d. Repair or replace any electrical lead that shows NO continuity.

#### Cable

- a. Inspect power cable for cracked or frayed insulation material.
- b. Inspect all terminals for damaged or missing insulation.
- c. Disconnect each of the power cable terminations and using a multimeter on a low ohms scale, touch probes to each termination and their corresponding connector pin and verify that there is continuity (see Wiring Diagram, Appendix B)
  - (1) K1-4
  - (2) K1-5
  - (3) GROUND
- d. Repair or replace power cable if there is NO continuity.

11. Top Rear Panel

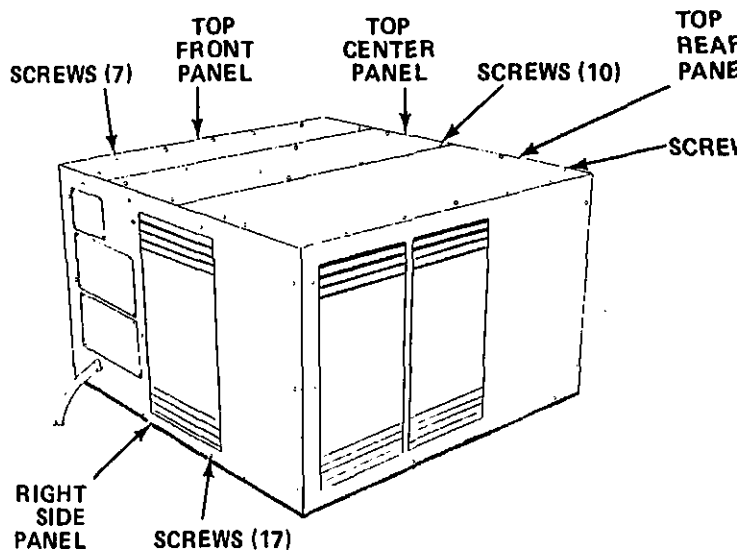
- a. Align holes in top rear panel with housing.
- b. Secure top rear panel with nine screws.

12. Top Front Panel

- a. Align holes in top front panel with housing.
- b. Secure top front panel with nine screws.

13. Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with nine screws.



**INITIAL SETUP****Material/Parts**

Left Side Panel Screws (17)

**Troubleshooting Reference**

AIR CONDITIONER, Malfunction

**Approximate Time Required (in minutes)**

Removal	10
Inspection	5
Installation	10
TOTAL TIME	25

**References**

None

**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****LEFT SIDE OF HOUSING**

Left Side Panel

- Remove seventeen (17) screws from left side panel to housing.
- Remove left side panel.

**INSPECTION**

Compressor

- Visually inspect compressor for damage.
- Inspect compressor tubing and connections for leaks.
- Tighten fittings and report damage to direct support maintenance personnel.

**INSTALLATION**

Left Side Panel

- Align holes in left side panel with housing.
- Secure left side panel with screws.



Front Panel Screws (14)  
 Top Center Panel Screws (10)  
 Top Front Panel Screws (7)  
 Top Rear Panel Screws (9)  
 Right Side Panel Screws (17)  
 Rear Panel Screws (14)  
 Return Air Grill Screws (8)

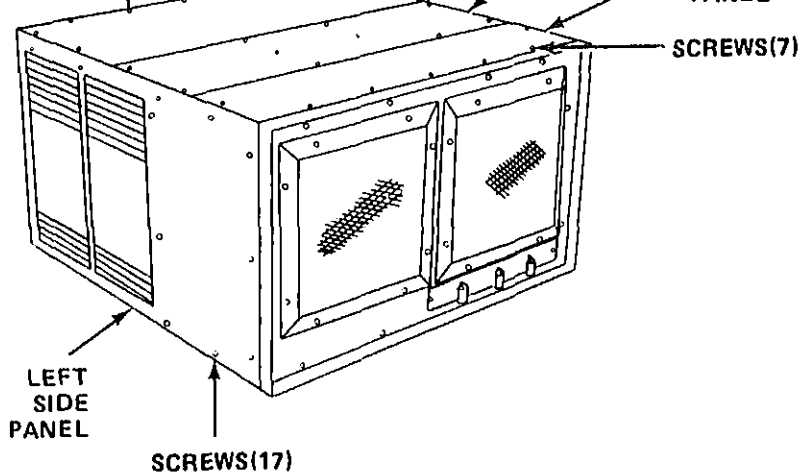
Troubleshooting Reference  
 None  
 Approximate Time Required (in minutes)  
 Removal  
 Inspection  
 Installation  
 TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## REMOVAL

### TOP AND LEFT SIDE OF HOUSING

- |                     |   |
|---------------------|---|
| 1. Top Center Panel | <ul style="list-style-type: none"> <li>a. Remove ten (10) screws securing top center panel.</li> <li>b. Remove top center panel.</li> </ul>     |
| 2. Top Front Panel  | <ul style="list-style-type: none"> <li>a. Remove seven (7) screws securing top front panel.</li> <li>b. Remove top front panel.</li> </ul>      |
| 3. Top Rear Panel   | <ul style="list-style-type: none"> <li>a. Remove nine (9) screws securing top rear panel.</li> <li>b. Remove top rear panel.</li> </ul>         |
| 4. Left Side Panel  | <ul style="list-style-type: none"> <li>a. Remove seventeen (17) screws securing left side panel.</li> <li>b. Remove left side panel.</li> </ul> |



ICATION/ITEM

REMARKS

ACTION

AL

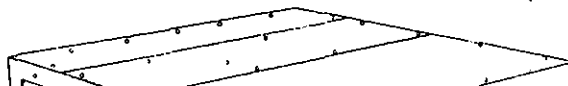
## SIDE AND REAR OF HOUSING

Side Panel

- a. Remove seventeen (17) screws securing side panel.
- b. Remove right side panel.

Panel

- a. Remove fourteen (14) screws securing panel.
- b. Remove rear panel.

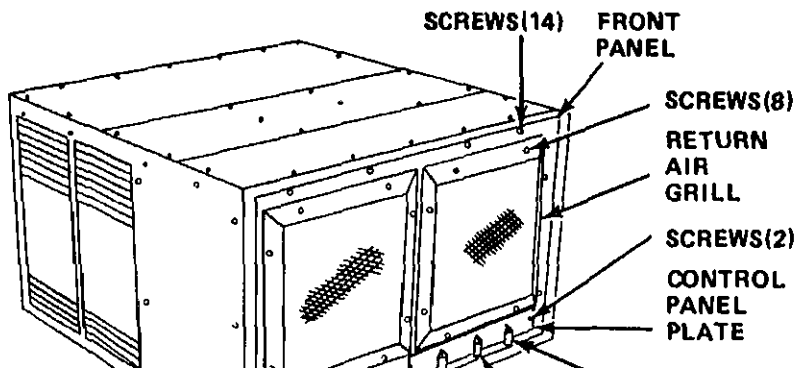


Diffuser Grill

Control Panel Plate

Front Panel

- return air grill and remove wire.
  - b. Remove eight (8) screws securing return air grill.
  - c. Remove return air grill.
- a. Remove eight (8) screws securing air diffuser grill.
  - b. Remove air diffuser grill.
- a. Loosen setscrews and remove knob from fresh air control, selector switch and thermostat switch.
  - b. Remove two (2) screws securing control panel plate.
  - c. Remove control panel plate.
- a. Remove two (2) screws securing thermostat switch to front panel.
  - b. Remove fourteen (14) screws securing front panel.
  - c. Remove front panel.



- d. If the system is in poor condition.
- e. Inspect all fittings for leaks.
- f. Tighten fittings and report damaged components to direct support maintenance personnel.

## INSTALLATION

### FRONT OF HOUSING

#### Front Panel

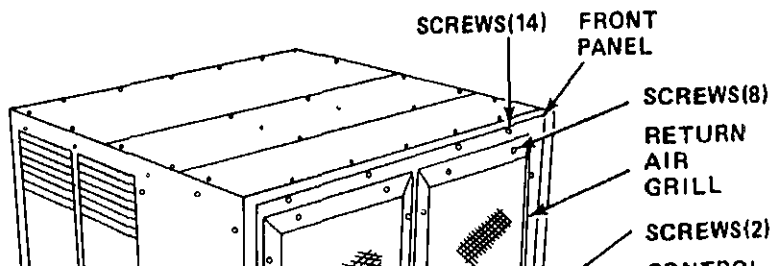
- a. Align holes in thermostat switch with front panel.
- b. Secure thermostat switch to front panel with two (2) screws.
- c. Align holes in front panel with housing.
- d. Secure front panel with fourteen (14) screws.

#### Control Panel Plate

- a. Align holes in control panel plate with front panel.
- b. Secure control panel plate with two (2) screws.
- c. Install three (3) knobs.

#### Air Diffuser Grill

- a. Align holes in air diffuser grill with front panel.
- b. Secure air diffuser grill with eight (8) screws.



## INSTALLATION

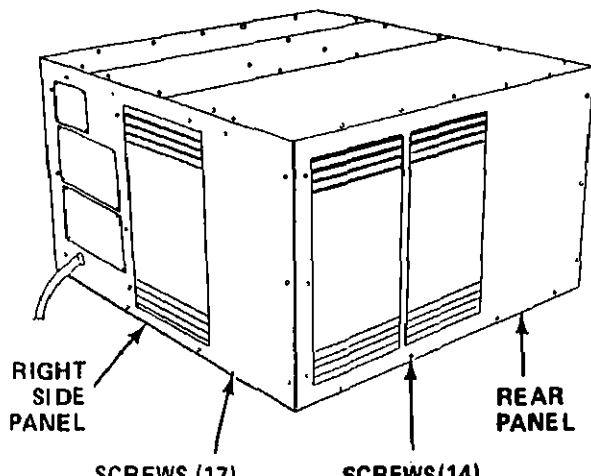
### FRONT SIDE AND REAR OF HOUSING

Rear Panel

- b. Secure return air grill with eight (8) screws.
- c. Install wire in mechanical screw post. Tighten mechanical screw post.

Right Side Panel

- a. Align holes in rear panel with housing.
  - b. Secure rear panel with fourteen (14) screws.
- a. Align holes in right side panel with housing.
  - b. Secure right side panel with seven (7) screws.





Top Rear Panel

Top Front Panel

Top Center Panel

housing.  
*b.* Secure left side panel with screws.

*a.* Align holes in top rear panel housing.

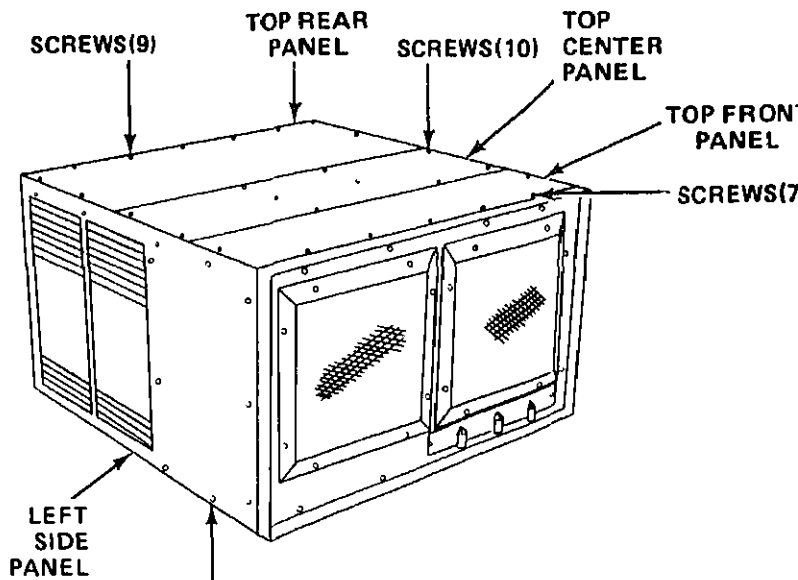
*b.* Secure top rear panel with nine

*a.* Align holes in top front panel housing.

*b.* Secure top front panel with sev

*a.* Align holes in top center panel top front and top rear panels.

*b.* Secure top center panel with te



**INITIAL SETUP****Material/Parts**

Air Diffuser Grill Screws (8)  
Left Side Panel Screws (17)  
Dry Cleaning Solvent

**References**

None

**Troubleshooting Reference**

AIR OUTPUT, Malfunction 1, S

**Approximate Time Required (in minutes)**

Removal	1
Inspection and Service	1
Installation	1
TOTAL TIME	3

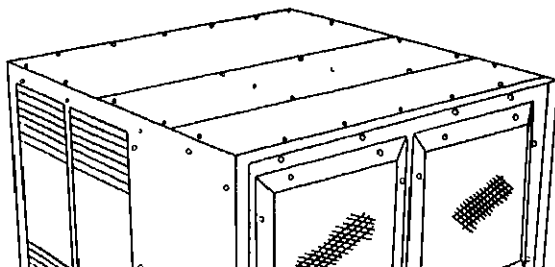
**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****FRONT AND LEFT SIDE OF HOUSING**

Air Diffuser Grill

- Remove eight (8) screws securing grill to front panel.
- Remove air diffuser grill.

Left Side Panel

- Remove seventeen (17) screws securing side panel to housing.
- Remove left side panel.



contact. Do not use near open flame or excessive heat. Flash point of solvent is 100° F (38° C).

## WARNING

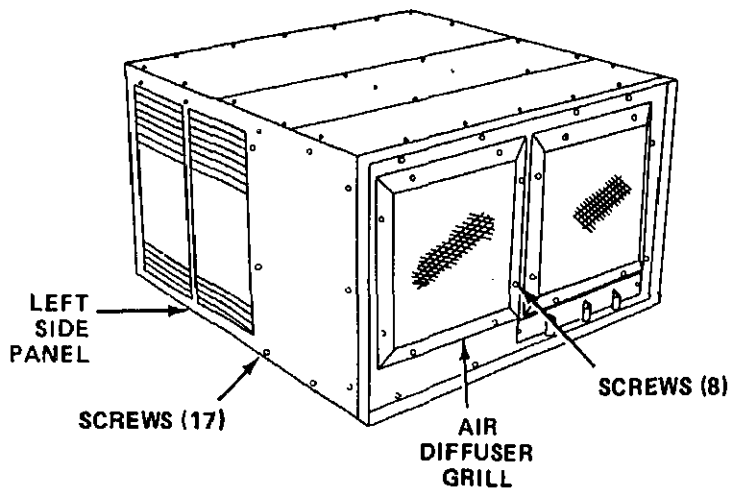
*Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.*

Evaporator Coil

- a.* Inspect evaporator coil for cleanliness.
- b.* Scrub the external portion of evaporator coil with a stiff bristle brush to remove corrosion.
- c.* Use low pressure compressed air to remove loose material.
- d.* Wipe evaporator coil with a cloth moistened with dry cleaning solvent, specify P-D-680 or P-S-661.
- e.* Inspect evaporator coil for leaks.
- f.* Straighten bent fins.
- g.* Report damaged condition to direct maintenance personnel.

## Side Panel

- a. Align holes in left side panel with housing.
- b. Secure left side panel with seventeen screws.



## INITIAL SETUP

### Material/Parts

Rear Panel Screws (14)

Dry Cleaning Solvent

### Troubleshooting Reference

AIR CONDITIONER, M

AIR OUTPUT, Malfunc

### Approximate Time Required

Removal

Inspection and Service

Installation

TOTAL TIME

### References

None

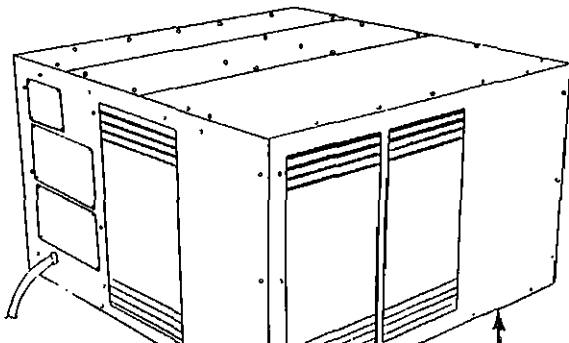
LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

REMOVAL
---------

## REAR OF HOUSING

### 1. Rear Panel

- Remove fourteen (14) panel to housing.
- Remove rear panel.



## WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

### Condenser Coil

- a.* Inspect condenser coil for cleanliness.
- b.* Scrub the external portion of coil with a stiff bristle brush to remove corrosion.
- c.* Use low pressure compressed air to remove loose material.
- d.* Wipe condenser coil with a cloth moistened with dry cleaning solvent, such as P-D-680 or P-S-661.
- e.* Inspect condenser coil for leaks.
- f.* Straighten bent fins.
- g.* Report damaged condition to district maintenance personnel.

## INSTALLATION

### REAR OF HOUSING

#### Rear Panel

- a.* Align holes in rear panel with housing.
- b.* Secure rear panel with fourteen

**INITIAL SETUP**

Material/Parts

Rear Panel Screws (14)

Troubleshooting Reference

None

Approximate Time Required (in m

Removal

Inspection

Installation

TOTAL TIME

References

None

LOCATION/ITEM

REMARKS

ACTION

**NOTE**

The sight glass may be inspected by looking through the louvers in the left side panel. If you cannot see the sight glass through the left side panel, then remove the rear panel.

**REMOVAL****REAR OF HOUSING**

. Rear Panel

- a. Remove fourteen (14) screws from rear panel to housing.
- b. Remove rear panel.

**INSPECTION**

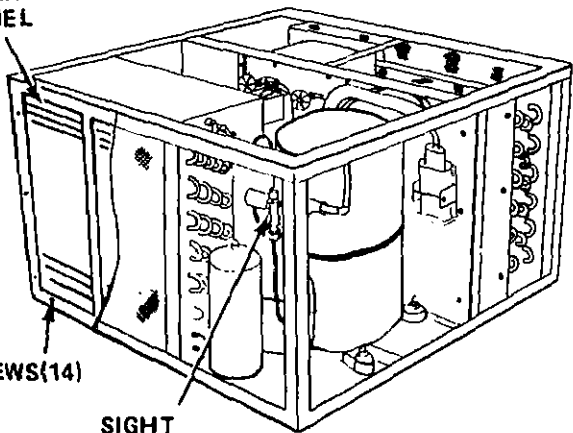
. Sight Glass

- a. With air conditioner operating on *cooling air*, inspect sight glass.
- b. Yellow appearance of humectant indicates moisture in system. Milky flow in refrigerant indicates low refrigerant charge.
- c. Report presence of these conditions to support maintenance personnel.

**REAR  
PANEL**

**SCREWS(14)**

**SIGHT  
GLASS**





## INITIAL SETUP

### Material/Parts

- Top Center Panel Screws (10)
- Top Front Panel Screws (7)
- Right Side Panel Screws (17)

### References

None

### Troubleshooting Reference

None

### Approximate Time Required (in minutes)

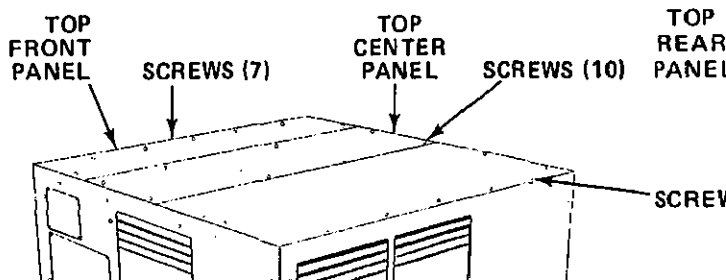
Removal  
Inspection  
Installation  
TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## REMOVAL

### TOP AND RIGHT SIDE OF HOUSING

1. Top Center Panel
  - a. Remove ten (10) screws securing top center panel.
  - b. Remove top center panel.
2. Top Front Panel
  - a. Remove seven (7) screws securing top front panel.
  - b. Remove top front panel.
3. Right Side Panel
  - a. Remove seventeen (17) screws securing right side panel.
  - b. Remove right side panel.



- b. Inspect capillary tube for kinks or breaks.
- c. Inspect sensing bulb for secure attachment and be sure it is completely covered with insulation tape.
- d. Report damaged condition to direct maintenance personnel.

## INSTALLATION

### FRONT AND RIGHT SIDE OF HOUSING

Right Side Panel

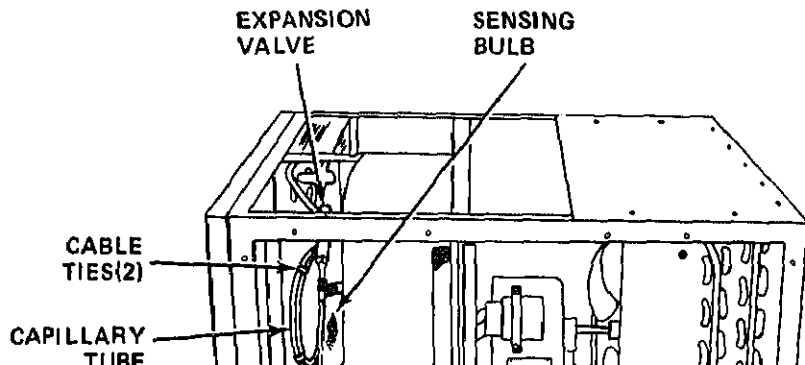
- a. Align holes in right side panel with housing.
- b. Secure right side panel with seventeen screws.

Top Front Panel

- a. Align holes in top front panel with housing.
- b. Secure top front panel with seven (7) screws.

Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with ten (10) screws.



services should be performed, and all known deficiencies corrected.

## INDEX

	Para	Page
Common Tools and Equipment	5-2	5-1
Consumable Materials	5-4	5-1
Direct Support Maintenance Procedures	5-7	5-4
Direct Support Troubleshooting	5-5	5-2
Direct Support Troubleshooting Table	5-6	5-2
Maintenance Repair Parts	5-1	5-1
Special Tools and Test Equipment	5-3	5-1

## Section I. REPAIR PARTS, SPECIAL TOOLS, AND SUPPORT EQUIPMENT

### 5-1. MAINTENANCE REPAIR PARTS

Repair parts for the air conditioner are listed and illustrated in TM 5-4120-341-23P.

### 5-2. COMMON TOOLS AND EQUIPMENT

For common tools and equipment, refer to the Table of Organization and Equipment (TOE).

### 5-3. SPECIAL TOOLS AND TEST EQUIPMENT

No special tools or test equipment are required.

### 5-4. CONSUMABLE MATERIALS

Item No.  
5

Name  
Refrigerant

Specific  
R-12

ture of the air conditioner. Each malfunction is followed by a list of probable causes and actions to remedy the malfunction. You should perform the tests/inspections and corrective actions indicated.

b. This manual cannot list all malfunctions that may occur; nor all tests or inspections and actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

## 6. DIRECT SUPPORT TROUBLESHOOTING TABLE

Malfunction

Test or Inspection

Corrective Action

### COMPRESSOR

#### COMPRESSOR WILL NOT START

- Step 1.* Check compressor for proper operation and damage.  
Replace defective compressor (para. 5-9).

#### COMPRESSOR CYCLES INTERMITTENTLY

- Step 1.* Inspect sight glass for proper amount of refrigerant.  
Add refrigerant as required (para. 5-8).
- Step 2.* Check for high discharge pressure.  
Discharge refrigerant from system (para. 5-8).
- Step 3.* Check for air in refrigerant system.  
Purge refrigerant system (para. 5-8).

### AIR CONDITIONER

#### HIGH DISCHARGE PRESSURE

- Step 1.* Check for excessive refrigerant in system.  
Discharge refrigerant from system (para. 5-8).
- Step 2.* Check for air in refrigerant system.  
Purge refrigerant system (para. 5-8).

#### LOW DISCHARGE PRESSURE

- Step 1.* Check to see if compressor is pumping.  
Replace defective compressor (para. 5-9).

- Step 1.*     Inspect expansion valve for proper operation.  
               **Replace defective expansion valve (para. 5-15).**
- Step 2.*     Check to see if dehydrator is clogged or defective.  
               **Remove restriction or replace dehydrator (para. 5-13).**

## OW SUCTION AND DISCHARGE PRESSURE

- Step 1.*     Inspect sight glass for proper amount of refrigerant.  
               **Add refrigerant as required (para. 5-8).**
- Step 2.*     Inspect refrigerant piping for leaks.  
               **Repair leaks or replace piping (para. 5-10).**
- Step 3.*     Inspect expansion valve for proper operation and damage.  
               **Replace defective expansion valve (para. 5-15).**

Compressor	5-9	5-11
Condenser Coil	5-12	5-38
Dehydrator	5-13	5-43
Evaporator Coil	5-11	5-28
Expansion Valve	5-15	5-47
General	5-7	5-4
Refrigerant Piping	5-10	5-18
Refrigerant Servicing	5-8	5-5
Sight Glass	5-14	5-45

## 5-7. GENERAL

The following information pertains to all procedures for the direct support maintenance personnel.

### INITIAL SETUP

Applicable Configurations  
All

Special Environmental Conditions  
None

Test Equipment  
None

Special Tools  
None

Personnel Required  
Direct Support Maintenance

### General Safety Instructions

Disconnect the power source before any maintenance function. Do not use air for cleaning purposes except where less than 30 psi and then only with eye guarding and personal protective equipment.

**AL SETUP****Material/Parts**

Top Center Panel Screws (10)  
 Dry Nitrogen  
 Refrigerant R-12  
 Rear Panel Screws (14)

**Troubleshooting Reference**

COMPRESSOR, Malfunction 2, St  
 COMPRESSOR, Malfunction 2, S  
 COMPRESSOR, Malfunction 2, St  
 AIR CONDITIONER, Malfunction  
 AIR CONDITIONER, Malfunction  
 AIR CONDITIONER, Malfunction  
 AIR CONDITIONER, Malfunction  
 AIR CONDITIONER, Malfunction

**References**

Paragraph 5-13

**Approximate Time Required (in minutes)**

Removal	10
Test	30
Service	720
Installation	10
<b>TOTAL TIME</b>	<b>770</b>

**LOCATION/ITEM****REMARKS****ACTION**

**VAL**

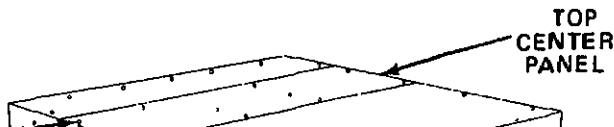
**END REAR OF HOUSING**

Center Panel

- a. Remove ten (10) screws securing panel.
- b. Remove top center panel.

Rear Panel

- a. Remove fourteen (14) screws securing rear panel.
- b. Remove rear panel.

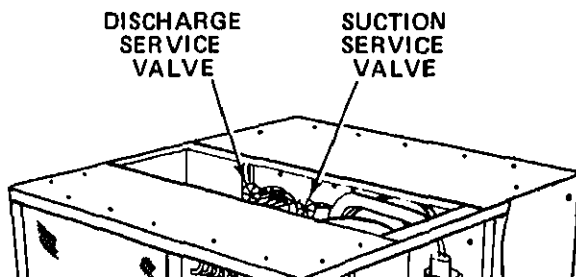




- b. Pressure check the refrigerant follows:
- (1) Connect suction pressure suction service valve.
  - (2) Start air conditioner
  - (3) Connect discharge pressure discharge service valve.
  - (4) Open discharge and suction valves.
  - (5) Compare gauge readings with range of system pressure as shown following table.
  - (6) Close discharge and suction valves.
  - (7) Remove gauges and install valves.

### Normal Operating Pressures

<i>Outdoor Ambient Temperature</i>	
<i>120° F/125° F(48.9° C/57.7° C)</i>	<i>95° F(35° C)</i>
At 90° F/75° F(32.2° C/23.9° C) DB return air to unit	
54-64 psi(374-443 kPa)	
230-260 psi(1592-1799 kPa)	
At 80° F/67° F(26.7° C/19.4° C) DB return air to unit	
38-49 psi (263-339 kPa)	
160-185 psi (1107-1280 kPa)	



## Large Refrigerant System

- a. Remove valve cap from suction service valve.
- b. Attach suitable hose to suction service valve.
- c. Open suction service valve and collect refrigerant into a suitable container.
- d. Close suction service valve, remove hose, and install valve cap.

### CAUTION

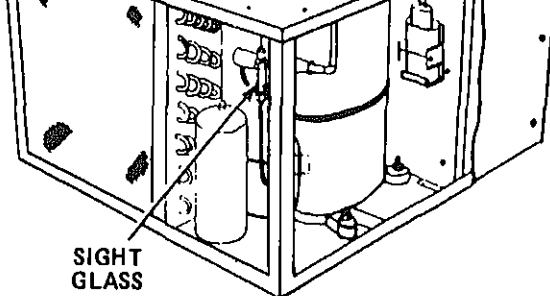
Discharge refrigerant system slowly over a period of two hours to prevent loss of oil.

Refrigerator

Refer to paragraph 5-13 and replace dehydrant.

## Refrigerant System

- a. Remove valve cap from discharge and suction service valves.
- b. Using proper nitrogen regulator connect nitrogen cylinder to suction service valve.
- c. Attach suitable hose to discharge service valve.
- d. Open both suction and discharge service valves.
- e. Open valve on nitrogen cylinder and allow nitrogen to flow through refrigerant system until all moisture is forced out. Do not exceed 5 psig.
- f. Close nitrogen cylinder valve.
- g. Close suction and discharge service valves.
- h. Remove nitrogen cylinder and discharge valve cap.
- i. Using bar manifold, connect vacuum gauge to center hose. Using proper hoses, connect suction service valve to suction manifold.
- j. Turn on vacuum pump, open service valve, and hold a 29.0 inch Hg vacuum for (8) hours.
- k. Close suction and discharge service valves.



ATION/ITEM

REMARKS

ACTION

HOUSING

**WARNING**

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that Refrigerant 12 does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

**NOTE**

The following steps *a.* through *i.*, apply only to a completely evacuated system. To add additional refrigerant to a charged system, refer to steps *f.* through *j.*

ing Refrigerant System

- a.* Remove valve cap from suction discharge valve.
- b.* Place inverted refrigerant drum on scale.

- k.* Operate air conditioner in cooling mode for 15 minutes.
- l.* Check sight glass for gas bubbles. If bubbles are present, add additional refrigerant (steps *m.* through *v.*).
- m.* Place the same refrigerant drum in an upright position on a scale.
- n.* Remove valve cap from suction service valve.
- o.* Loosely connect charging line to suction service valve.
- p.* Partially open refrigerant drum valve to purge air from charging line.
- q.* Close refrigerant drum valve and disconnect charging line at suction service valve.

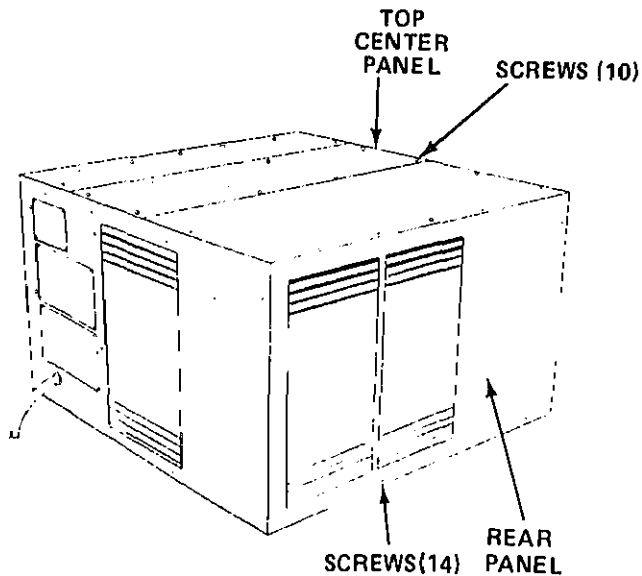
### **CAUTION**

**Add refrigerant slowly to avoid slugging at the compressor.**

- r.* With air conditioner operating in cooling mode, open discharge valve and add refrigerant to drum valve and add approximately one ounce per minute of refrigerant. Observe sight glass and when bubbles appear close suction service valve.
- s.* Close refrigerant drum valve.
- t.* Carefully loosen charging line to relieve trapped pressure.
- u.* Disconnect charging line and install on suction service valve.

Top Center Panel

- housing.
- b.* Secure rear panel with fourteen (14)
  - a.* Align holes in top center panel with top front panel and top rear panel.
  - b.* Secure top center panel with ten (10)



## INITIAL SETUP

### Material/Parts

- Top Center Panel Screws (10)
- Top Rear Panel Screws (9)
- Rear Panel Screws (14)
- Nuts (4)
- Capscrews (4)
- Flat Washers (8)

### References

- Paragraph 2-12
- Paragraph 2-14
- Paragraph 5-8
- Paragraph 5-13

### Troubleshooting Reference

COMPRESSOR, Malfunction  
AIR CONDITIONER, Malfunction

### Approximate Time Required (in hours)

Removal

Test

Service

Repair

Installation

TOTAL TIME

## LOCATION/ITEM

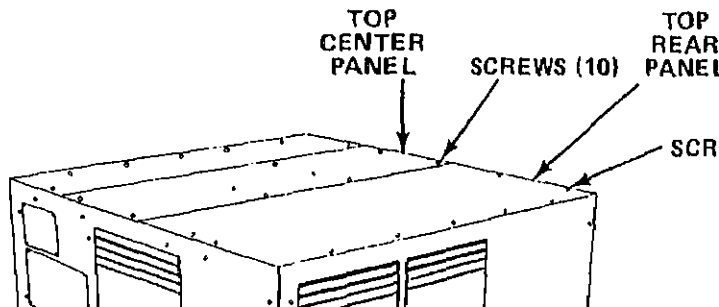
## REMARKS

## ACTION

### REMOVAL

#### 1. Top Center Panel

- Remove ten (10) screws from top center panel to top front and top rear panels.
- Remove top center panel.



## Rear Panel

- b. Remove top rear panel.
- a. Remove fourteen (14) screws panel to housing.
- b. Remove rear panel.

## LEFT SIDE OF HOUSING

### Left Side Panel

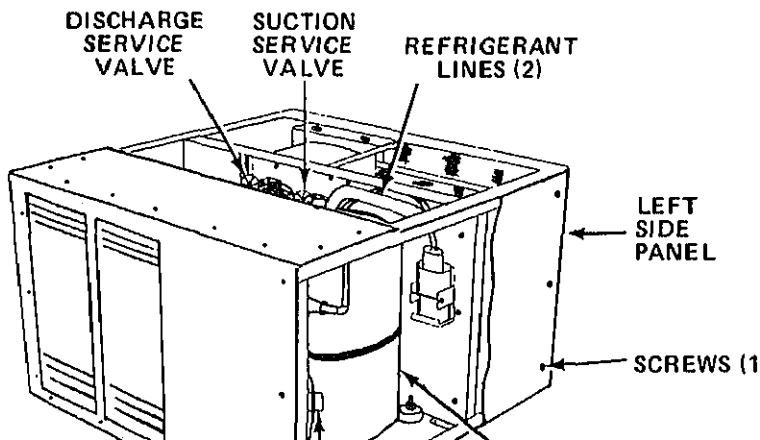
- a. Remove seventeen (17) screws side panel to housing.
- b. Remove left side panel.

### NOTE

Testing of the compressor is to be done while the air conditioner is operating and supplying cooling air.

### Refrigerant Servicing

Refer to paragraph 5-8 and discharge system.



- c. Unsolder and remove discharge line compressor.
- d. Remove four (4) nuts, capscrews and eight (8) flatwashers securing compressor to housing.
- e. Tag and disconnect electrical leads from compressor.
- f. Remove compressor from housing the left side.



pressures are as follows:

### Normal Operating Pressures

*Outdoor Ambient Temperature*  
125° F (51.6° C) 95° F (35° C)

Pressure	At 90° F (32.2° C) DB or 80° F (26.7° C) WB
Pressure	54-64 psi (374-443 kPa)
	230-260 psi (1592-1799 kPa)
	At 80° F (26.7° C) DB or 67° F (19° C) WB
Pressure	39-49 psi (270-339 kPa)
Pressure	160-185 psi (1107-1280 kPa)

- d. Stop air conditioner.
- e. Close suction and discharge service valve.
- f. Remove gauges.
- g. Operate the air conditioner in the cooling mode and using a multimeter, measure insulation resistance of the compressor internal motor windings at the start relay selector switch.
- h. Verify that the insulation resistance between the windings and compressor frame is less than 60 megohms.
- i. Verify that the insulation resistance of the main winding (terminal pin A to ground) is between .6 and .8 ohms.
- j. Verify that the insulation resistance of the auxiliary winding (terminal pin A to ground) is between 5 and 7 ohms.
- k. If testing indicates that the compressor is defective, remove or repair compressor.

- removes or replaces the compressor.
- (1) Refer to paragraph 5-8 for refrigerant system.
  - (2) Purge refrigerant system with dry nitrogen (paragraph 5-8).
  - (3) Remove defective compressor.
  - (4) With compressor removed, purge refrigerant system with dry nitrogen (paragraph 5-8).
  - (5) Install new compressor.
  - (6) Install new dehydrator (paragraph 5-13).
  - (7) Discharge refrigerant system three times (paragraph 5-8).
  - (8) Start and operate air conditioner for twenty-four (24) hours (paragraph 5-8).
  - (9) Stop air conditioner (paragraph 5-8).
  - (10) Discharge refrigerant system with dry nitrogen (paragraph 5-8).
  - (11) Remove dehydrator and install new one (paragraph 5-13).
  - (12) Discharge refrigerant system and recharge with refrigerant (paragraph 5-8).
  - (13) Operate air conditioner.

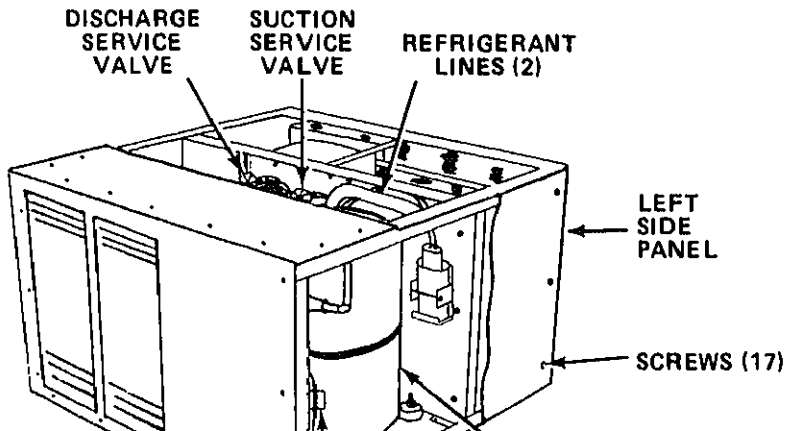
## INSTALLATION

### INSTALL LEFT SIDE OF HOUSING

compressor

- c.* Insulation to expose 1/2 inch of bare wire on each side of break.
- c.* Twist the wire ends together and solder the splice.
- d.* Cover the splice with PVC electrical tape, making certain to cover all repaired area.

- a.* Install compressor through left side of housing.
- b.* Align holes in compressor mounting flange with holes in housing.
- c.* Secure compressor with eight (8) flat head screws, four (4) cap screws and four (4) nuts.
- d.* Install two (2) refrigerant lines on compressor and tighten flare nut on suction service line.
- e.* Refer to paragraph 5-8 and solder on the suction refrigerant line.



Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14) screws.
- a. Align holes in top rear panel with housing.
- b. Secure top rear panel with nine (9) screws.

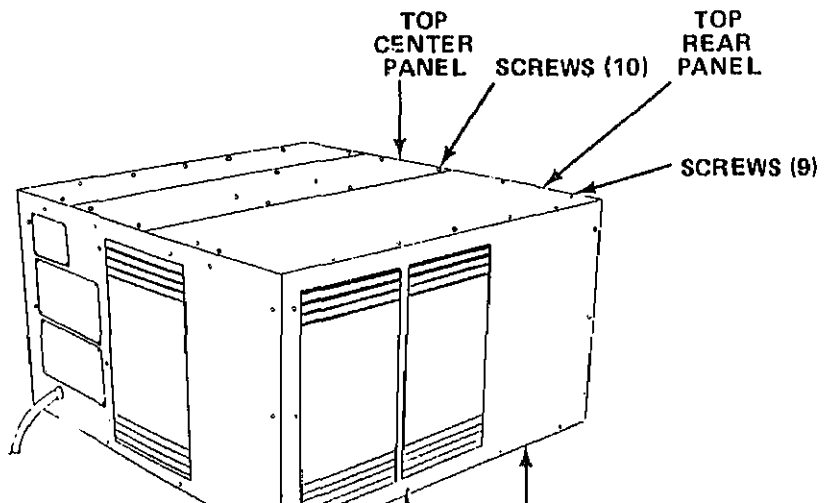
Rear Panel

Refrigerant System

Refer to paragraph 5-8 and charge refrigerant system. Refer to burnout procedure if low refrigerant has been detected.

Center Panel

- a. Align holes in top center panel with top rear panel and top front panel.
- b. Secure top center panel with ten (10) screws.



**INITIAL SETUP****Material/Parts**

Top Center Panel Screws (10)  
 Top Front Panel Screws (7)  
 Top Rear Panel Screws (9)  
 Right Side Panel Screws (17)  
 Rear Panel Screws (14)  
 Left Side Panel Screws (17)  
 Return Air Grill Screws (8)  
 Air Diffuser Grill Screws (8)  
 Control Panel Plate Screws (2)  
 Front Panel Screws (14)

**References**

Paragraph 5-8

**Troubleshooting Reference**

AIR CONDITIONER, Malfunction

**Approximate Time Required (in minutes)**

Removal	20
Testing and Repair	30
Installation	750
<b>TOTAL TIME</b>	<b>800</b>

**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****TOP AND LEFT SIDE OF HOUSING**

Top Center Panel

- Remove ten screws securing top center panel.
- Remove top center panel.

Top Front Panel

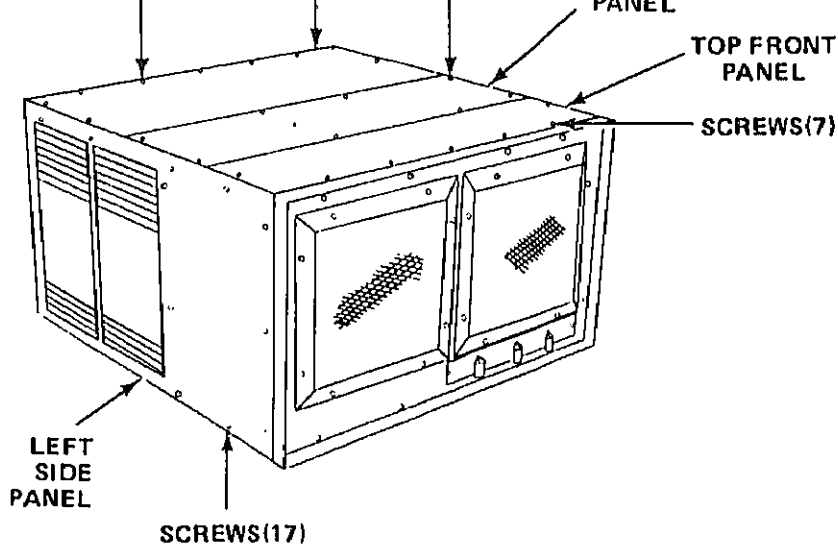
- Remove seven (7) screws securing top front panel.
- Remove top front panel.

Top Rear Panel

- Remove nine (9) screws securing top rear panel.
- Remove top rear panel.

Left Side Panel

- Remove seventeen (17) screws securing left side panel.
- Remove left side panel.



5. Right Side Panel

- a. Remove seventeen (17) screws from right side panel.
- b. Remove right side panel.

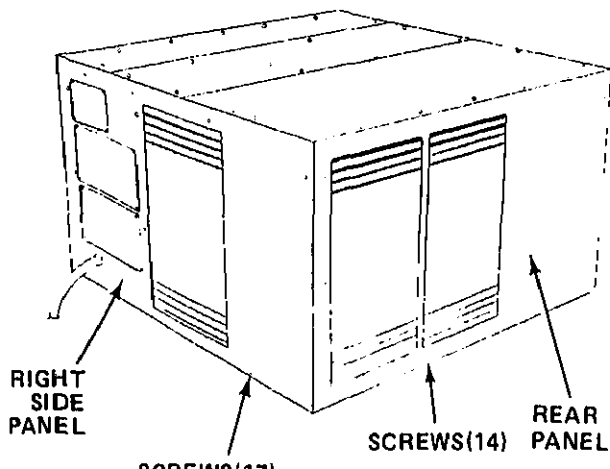
6. Rear Panel

- a. Remove fourteen (14) screws from rear panel.
- b. Remove rear panel.

FRONT OF HOUSING

7. Control Panel Plate

- a. Loosen setscrews and remove fresh air control, select fresh air control, select thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.



#### Return Air Grill

- a. Loosen mechanical screw post at remove wire.
- b. Loosen clamp on evaporator sh remove wire.
- c. Remove eight (8) screws securing grill.
- d. Remove return air grill.

#### Diffuser Grill

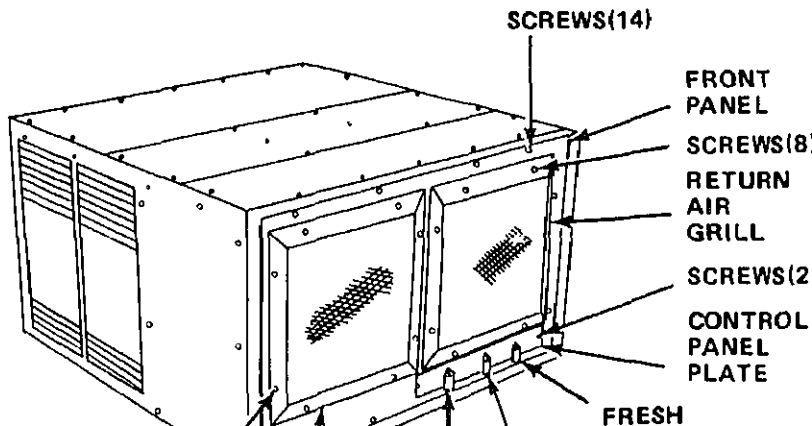
- a. Remove eight (8) screws securing a grill.
- b. Remove air diffuser grill.

#### Front Panel

- a. Remove two (2) screws securing switch to front panel.
- b. Remove fourteen (14) screws securing panel.
- c. Remove front panel.

#### Refrigerant System

Refer to paragraph 5-8 and discharge system.



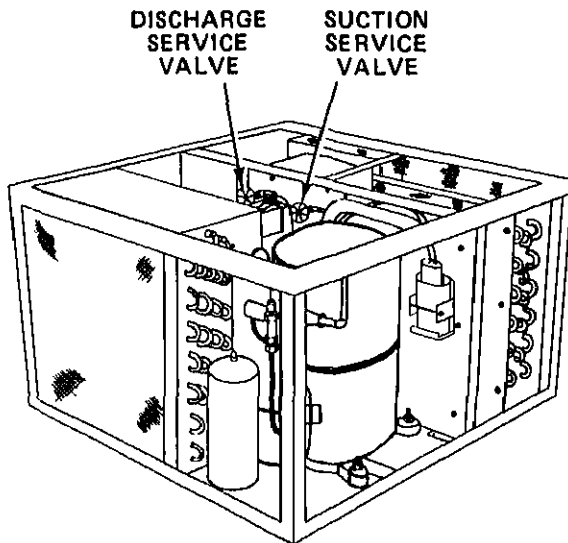


## Service Valves

- a. Unscrew and remove flare nuts from suction and discharge service valves.
- b. Remove refrigerant lines from suction and discharge service valves.
- c. Remove two (2) screws from each service valve.
- d. Remove suction and discharge service valves.

## Refrigerant Piping

- a. Unsolder and remove tubing or components necessary to remove a defective part of the system.
- b. When soldering, constantly purge the refrigerant system with dry nitrogen to prevent scale formation within the system (paragraph 5-8).



- a. Visually inspect all valves for signs of
- b. Inspect valve fittings for leaks.

## ING AND REPAIR

### WARNING

Avoid bodily contact with liquid refrigerant and avoid inhaling refrigerant gas. Be especially careful that refrigerant does not come in contact with eyes. In case of refrigerant leaks, ventilate area immediately.

#### Refrigerant Piping

- a. Check all piping and connections for leaks. Use a General Electrical Type H-2 Halogen Detector (or approved equal).
- b. Calibrate the detector with a General Electrical LS-20 leak standard (or approved equivalent) to a pure refrigerant leak rate of 0.1 year.
- c. Replace any piping or connections that are leaking.

## LLATION

#### Refrigerant Piping

- a. Solder all copper-to-copper joints with solder type 3, 4 or 6A per specification QQ-S-561.
- b. Solder all copper-to-brass or copper-to-steel joints with type 4 or 6A per specification.
- c. Solder melting point is 1160° F (622° C).
- d. Make all solder joints with an atmosphere of inert gas to prevent internal oxidation.

#### Service Valves

- a. Connect suction and discharge service valves to refrigerant piping.
- b. Tighten flare nuts at suction and discharge service valves.
- c. Secure suction and discharge service valves to bulkhead with four (4) screws.

## T OF HOUSING

## Air Diffuser Grill

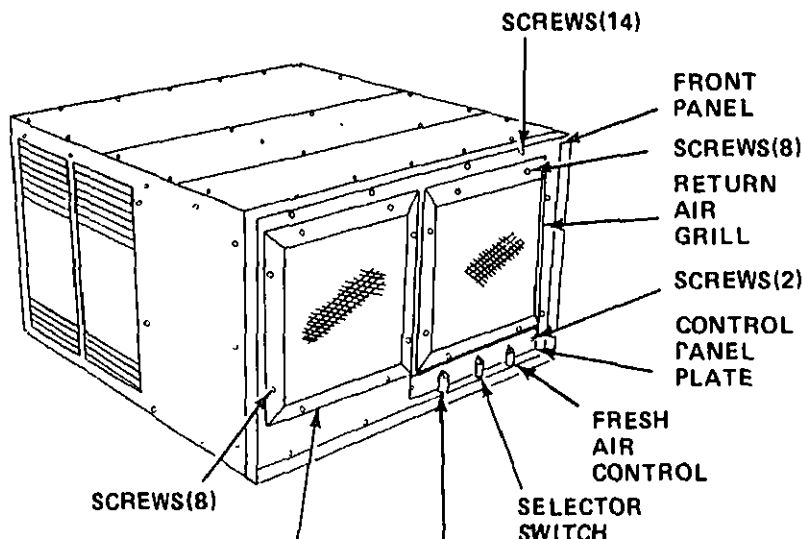
- a. Align holes in air diffuser grill with front panel.
- b. Secure air diffuser grill with eight (8)

## Return Air Grill

- a. Align holes in return air grill with front panel.
- b. Secure return air grill with eight (8) screws.
- c. Install wire through clamp on end shroud and tighten clamp.
- d. Install wire in mechanical screw post and tighten mechanical screw post.

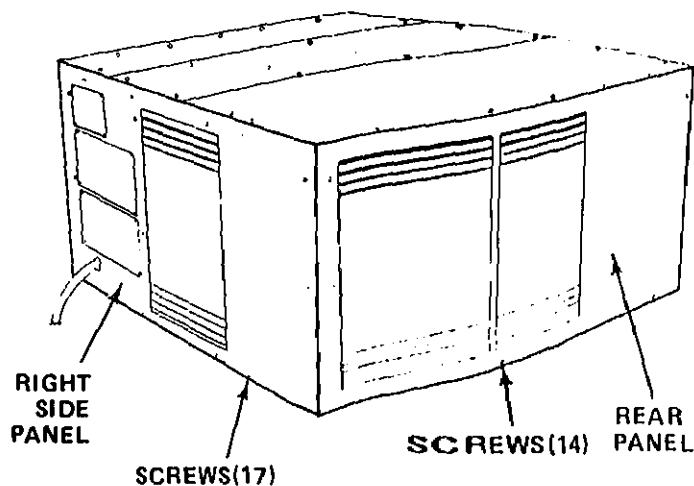
## Control Panel Plate

- a. Align holes in control panel plate with front panel.
- b. Secure control panel plate with screws.
- c. Install three (3) knobs.



de Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14)
- a. Align holes in right side panel with housing.
- b. Secure right side panel with seven (7) screws.



**26. Top Rear Panel**

- a* Align holes in top rear housing.
- b.* Secure top rear panel with

**27. Top Front Panel**

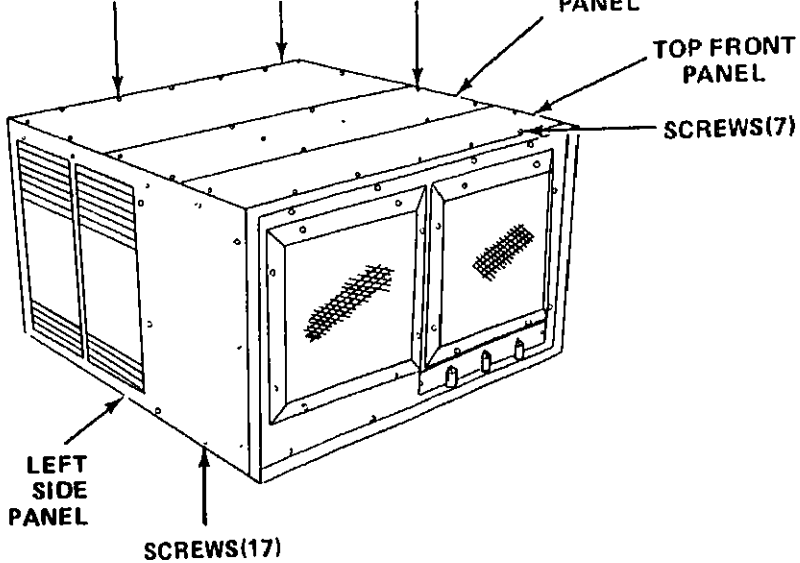
- a* Align holes in top front housing.
- b.* Secure top front panel wi

**28. Refrigerant Servicing**

Refer to paragraph 5-8 and system.

**29. Top Center Panel**

- a* Align holes in top center top front and top rear pan
- b.* Secure top center panel w



Top Rear Panel Screws (9)  
 Right Side Panel Screws (17)  
 Rear Panel Screws (14)  
 Left Side Panel Screws (17)  
 Thermostat Switch Screws (2)  
 Selector Switch Screws (2)  
 Control Panel Plate Screws (2)  
 Front Panel Screws (14)  
 Condenser Shroud Screws (2)  
 Frame Screws (8)  
 Evaporator Coil Screws (6)  
 Evaporator Coil Screws (4)

Troubleshooting Reference  
 None

Approximate Time Required (in  
 Removal  
 Test  
 Repair  
 Installation  
**TOTAL TIME**

## LOCATION/ITEM

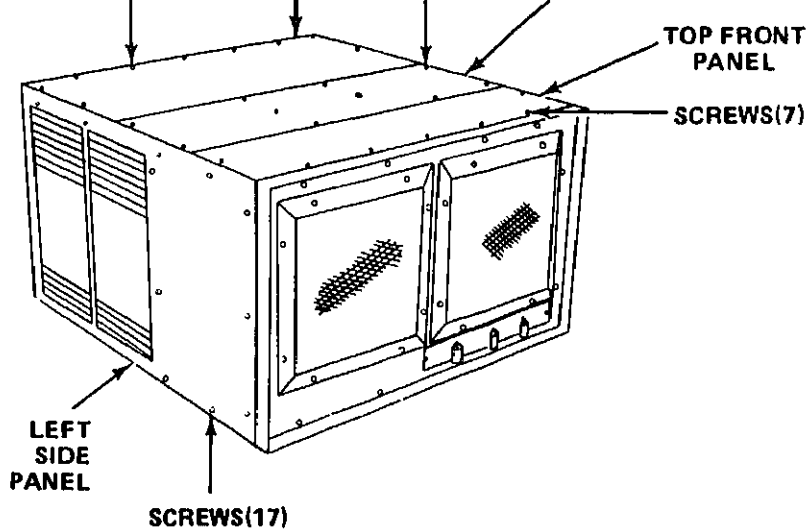
## REMARKS

## ACTION

### REMOVAL

#### TOP AND LEFT SIDE OF HOUSING

- |                     |   |
|---------------------|---|
| 1. Top Center Panel | <i>a.</i> Remove ten (10) screws s<br>panel.<br><i>b.</i> Remove top center panel.    |
| 2. Top Front Panel  | <i>a.</i> Remove seven (7) screws<br>panel.<br><i>b.</i> Remove top front panel.      |
| 3. Top Rear Panel   | <i>a.</i> Remove nine (9) screws<br>panel.<br><i>b.</i> Remove top rear panel.        |
| 4. Left Side Panel  | <i>a.</i> Remove seventeen (17) s<br>side panel.<br><i>b.</i> Remove left side panel. |

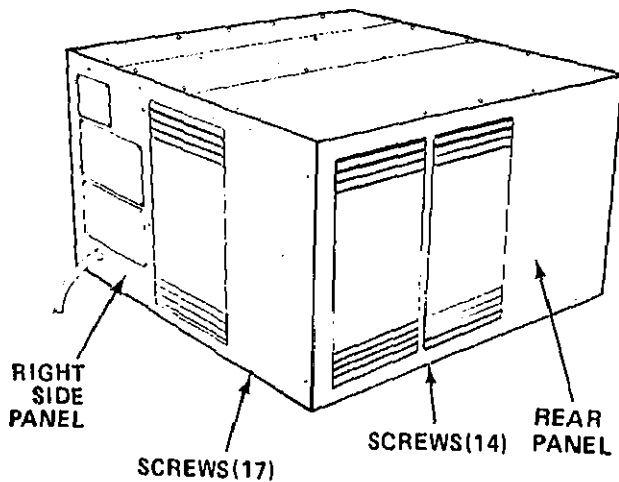




Right Side Panel

Rear Panel

- a. Remove seventeen (17) screws securing side panel.
- b. Remove right side panel.
- a. Remove fourteen (14) screws securing rear panel.
- b. Remove rear panel.



## Control Panel Plate

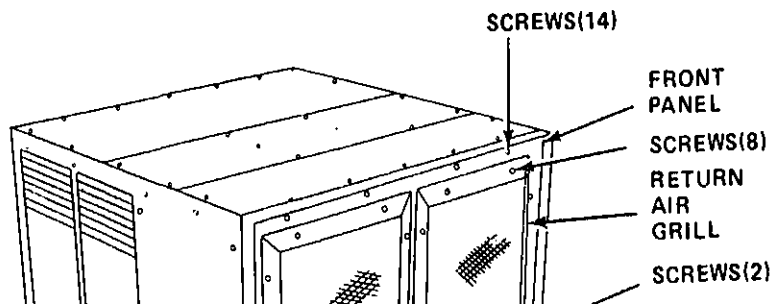
- a. Loosen setscrews and remove knob for fresh air control, selector switch and thermostat switch.
- b. Remove two (2) screws securing control panel plate.
- c. Remove control panel plate.

## Front Panel

- a. Loosen mechanical screw post at corner and remove wire.
- b. Loosen clamp on evaporator shroud and remove wire.
- c. Remove two (2) screws securing thermostat switch to front panel.
- d. Remove two (2) screws securing selector switch to front panel.
- e. Remove fourteen (14) screws securing front panel.
- f. Remove front panel.

## NOTE

Test evaporator coil for leaks prior to discharging refrigerant system and removing evaporator coil.



ING

Evaporator Coil

- d.* Remove frame from base.
  - e.* Remove air filter.
  - f.* Unsolder suction line approximately 12 inches below header and remove suction line from evaporator coil.
  - g.* Unscrew and remove flare nut from expansion valve and evaporator coil.
  - h.* Remove six (6) screws securing evaporator coil to bulkhead.
  - i.* Remove four (4) screws from under base that secure evaporator coil to base.
  - j.* Remove evaporator coil.
- 
- a.* Check all evaporator coil tubing and fittings with a General Electric T-10 Halogen Test Detector (or approved equivalent).
  - b.* Calibrate the detector with a General Electric LS-20 leak standard (or approved equivalent) to a pure refrigerant leak rate of 0.1 cc per year.
  - c.* Mark all spots where leaks are noticed.
  - d.* Repair leaks or replace evaporator coil.

SCREWS (2)

EVAPORATOR  
COIL

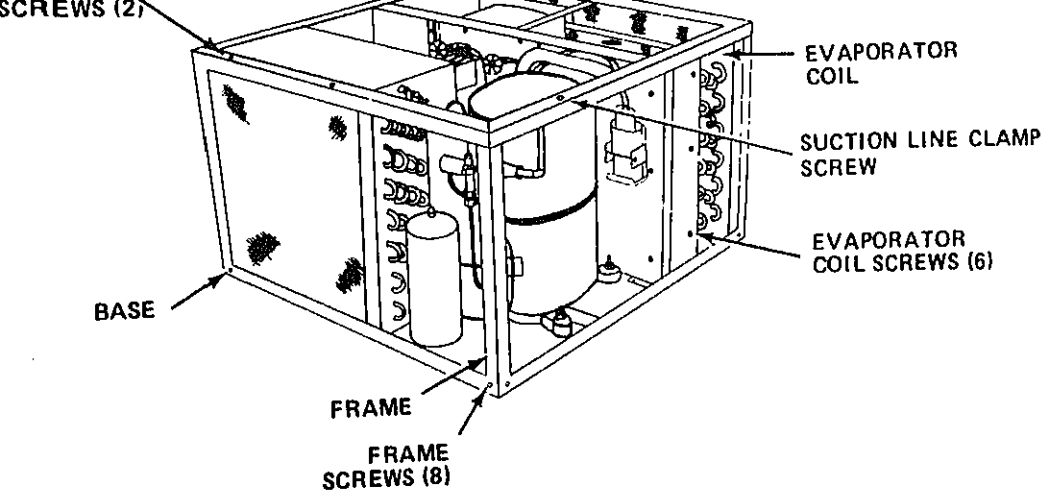
SUCTION LINE CLAMP  
SCREW

EVAPORATOR  
COIL SCREWS (6)

BASE

FRAME

FRAME  
SCREWS (8)



Evaporator Coil

## INSTALLATION

### INSTALLING INTERIOR

Evaporator Coil

- a.* Repair minor leaks or holes by soldering.
- b.* Use a silver solder with a 50% silver content and a melting point of approximately  $634.8^{\circ}\text{C}$ .
- c.* Straighten bent fins prior to installation.

- a.* Align holes in evaporator coil with holes in base.
- b.* Secure evaporator coil to base underside using four (4) screws.
- c.* Secure evaporator coil to bulkhead using six (6) screws.
- d.* Connect and solder two (2) refrigerant lines to evaporator coil.
- e.* Align holes in frame with holes in base.
- f.* Secure frame to base with eight (8) screws.
- g.* Secure frame to condenser coil with four (4) screws.
- h.* Connect suction line to evaporator coil approximately two (2) inches below the frame.
- i.* Refer to paragraph 5-8 and solder the suction line.
- j.* Connect refrigerant line between condenser coil and expansion valve and tighten.

## INSTALLATION

### INSTALLATION OF HOUSING

Front Panel

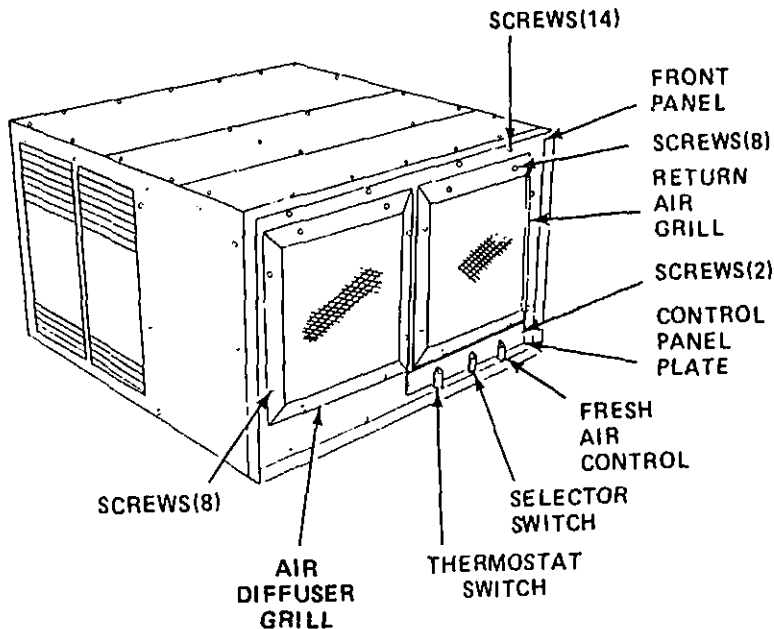
- a.* Align holes in thermostat switch with holes in front panel.
- b.* Secure thermostat switch to front panel using two (2) screws.
- c.* Align holes in selector switch with holes in front panel.
- d.* Secure selector switch to front panel using two (2) screws.

# INSTALLATION

## FRONT OF HOUSING

### Control Panel Plate

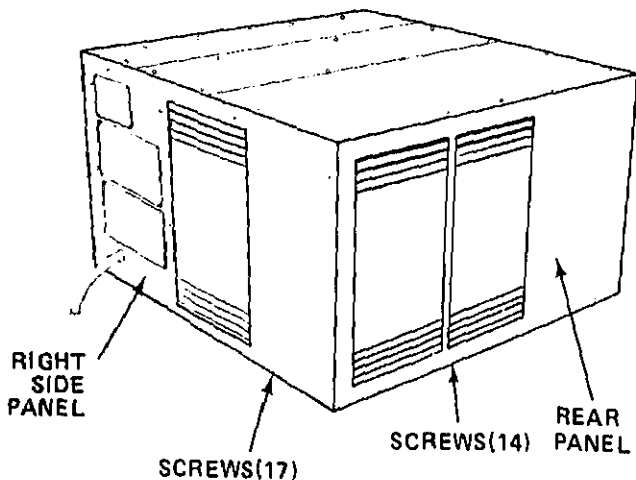
- Align holes in control panel plate in front panel.
- Secure control panel plate with screws.
- Install three (3) knobs.



Rear Panel

Right Side Panel

- a. Align holes in rear panel w housing.
  - b. Secure rear panel with fourteen
- 
- a. Align holes in right side panel w housing.
  - b. Secure right side panel with sev screws.



17. Left Side Panel

- a. Align holes in left side panel housing.
- b. Secure left side panel with screws.

18. Top Rear Panel

- a. Align holes in top rear panel housing.
- b. Secure top rear panel with nine

19. Top Front Panel

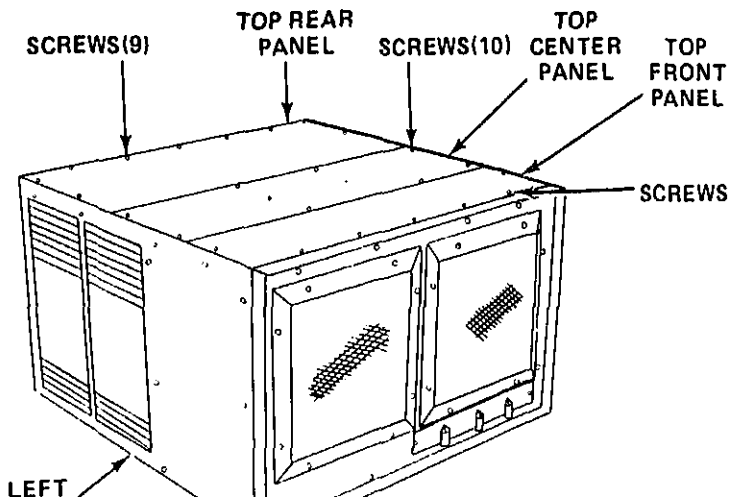
- a. Align holes in top front panel housing.
- b. Secure top front panel with sev

20. Refrigerant Servicing

Refer to paragraph 5-8 and char system.

21. Top Center Panel

- a. Align holes in top center panel top front and top rear panels.
- b. Secure top center panel with te





## INITIAL SETUP

### Material/Parts

Top Center Panel Screws (10)  
Top Rear Panel Screws (9)  
Left Side Panel Screws (17)  
Rear Panel Screws (14)  
Condenser Shroud Screws (2)  
Condenser Shroud Screws (6)  
Condenser Coil Screws (4)

### References

Paragraph 5-8

Troubleshooting Reference  
None

### Approximate Time Required (in minutes)

Removal  
Test  
Repair  
Installation  
TOTAL TIME

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## REMOVAL

### REMOVAL OF TOP AND LEFT SIDE OF HOUSING

Top Center Panel

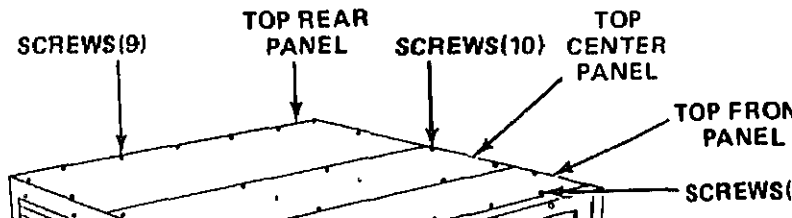
- Remove ten (10) screws securing top center panel.
- Remove top center panel.

Top Rear Panel

- Remove nine (9) screws securing top rear panel.
- Remove top rear panel.

Left Side Panel

- Remove seventeen (17) screws securing left side panel.
- Remove left side panel.



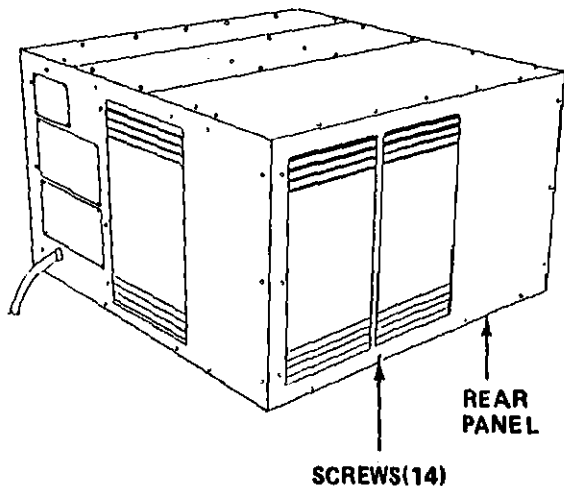
- a. Remove fourteen (14) screws securing panel.
- b. Remove rear panel.

#### NOTE

Test condenser coil for leaks prior to discharging refrigerant system and removing condenser coil.

ant System

Refer to paragraph 5-8 and discharge refrigerant system.



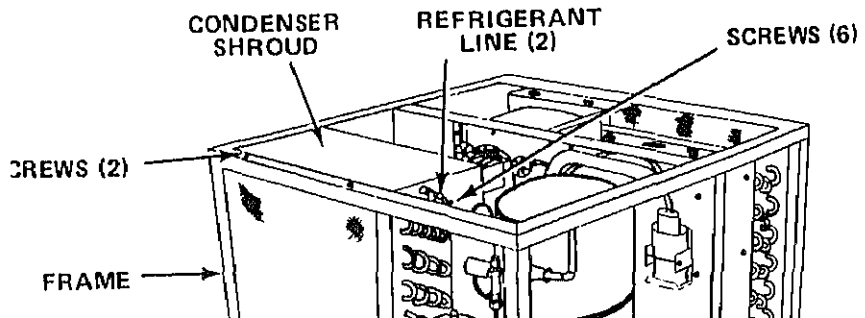
Condenser Coil

- a. Loosen setscrew in hub of condenser slide condenser fan towards bulkhead.
- b. Remove two (2) screws securing condenser shroud.
- c. Remove six (6) screws securing shroud to condenser coil.
- d. Slide condenser shroud back bulkhead.
- e. Unsolder and remove two (2) refrigerant lines from condenser coil.
- f. Remove four (4) screws from upper base that secures condenser coil to frame.
- g. Remove condenser coil.

**G**

Condenser Coil

- a. Check all condenser coil tubing fittings with a General Electric Halogen Test Detector (or approved equivalent).
- b. Calibrate the detector with a General Electric LS-20 leak standard (or approved equivalent) to a pure refrigerant leak rate of 0.1 year.
- c. Mark all spots where leaks are noted.
- d. Repair leaks or replace condenser coil.



and a melting point of approximately (634.8° C).

- c. Straighten bent fins prior to installation.

### WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F creates phosgene gas.

### INSTALLATION

#### Condenser Coil

- a. Align holes in condenser coil with base.
- b. Secure condenser coil to base from underside with four (4) screws.
- c. Align holes in condenser shroud with condenser coil.
- d. Secure condenser shroud with six (6) screws.
- e. Secure condenser shroud to frame with (2) screws.
- f. Reposition condenser fan on motor until hub is flush with end of shroud. Tighten setscrew in hub.
- g. Refer to paragraph 5-8 and solder refrigerant lines to condenser coil.

### INSTALLATION

#### REAR OF HOUSING

#### Rear Panel

- a. Align holes in rear panel with housing.
- b. Secure rear panel with fourteen (14) screws.



nel

- a. Align holes in left side panel with holes in housing.
- b. Secure left side panel with seventeen (17) screws.

nel

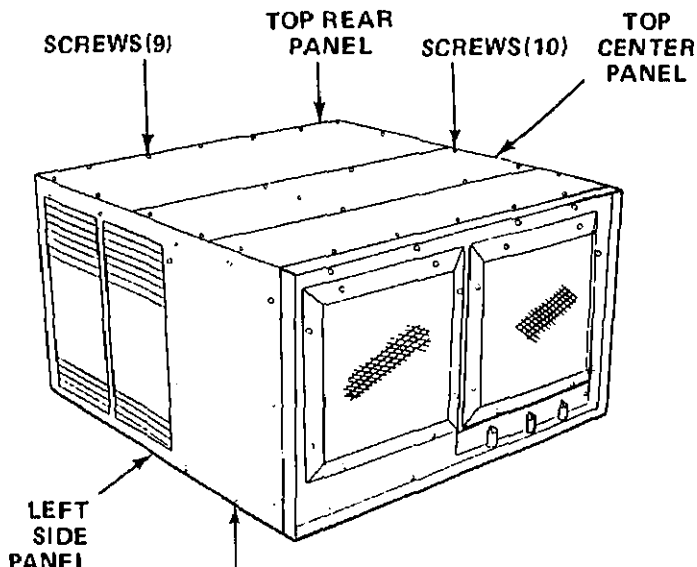
- a. Align holes in top rear panel with holes in housing.
- b. Secure top rear panel with nine (9) screws.

Servicing

Refer to paragraph 5-8 and charge refrigeration system.

Panel

- a. Align holes in top center panel with holes in top front and top rear panels.
- b. Secure top center panel with ten (10) screws.



**IAL SETUP****Material/Parts**

Right Side Panel Screws (17)

Return Air Grill Screws (8)

**Troubleshooting Reference**

AIR CONDITIONER, Malfunction 3

AIR CONDITIONER, Malfunction 4

**Approximate Time Required (in minutes)**

Removal 10

Installation 740

TOTAL TIME 750

**References**

Paragraph 5-8

**LOCATION/ITEM****REMARKS****ACTION****REMOVAL****RIGHT SIDE OF HOUSING**

Right Side Panel

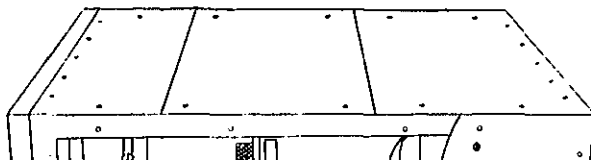
- a. Remove seventeen (17) screws securing right side panel to housing.
- b. Remove right side panel.

Return Air Grill

- a. Loosen setscrew and remove fresh air filter knob.
- b. Remove eight (8) screws securing return air grill to front panel.
- c. Partially remove return air grill.

Refrigerant System

Refer to paragraph 5-8 and discharge refrigerant system.

**RIGHT**

ator

ide Panel

Air Grill

rant Servicing

- a. Connect dehydrator to two (2) refrigerant lines.
  - b. Tighten two (2) flare nuts at dehydrator.
- 
- a. Align holes in right side panel with housing.
  - b. Secure right side panel with seventeen screws.
- 
- a. Align holes in return air grill with housing on front panel.
  - b. Secure return air grill with eight (8) screws.
  - c. Install knob on fresh air control and tighten setscrew.

Refer to paragraph 5-8 and charge refrigerant system.

**INITIAL SETUP****Material/Parts**

Rear Panel Screws (14)

**Troubleshooting Reference**

None

**Approximate Time Required (in minutes)**

Removal

10

Installation

740

TOTAL TIME

750

**References**

Paragraph 5-8

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

**REMOVAL****REMOVAL OF HOUSING**

Rear Panel

- a. Remove fourteen (14) screws securing rear panel to housing.

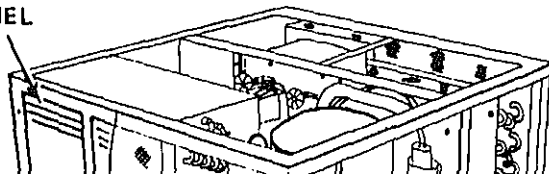
- b. Remove rear panel.

Refrigerant System

Refer to paragraph 5-8 and discharge refrigerant system.

Sight Glass

- a. Unscrew two (2) flare nuts and remove (2) refrigerant lines from sight glass.
- b. Remove sight glass from air conditioning unit.

**REAR  
PANEL**



Rear Panel

- a* Align holes in rear panel with housing.
- b* Secure rear panel with fourteen

Refrigerant System

Refer to paragraph 5-8 and charge system.

---

Removal	Installation
Test	
<b>INITIAL SETUP</b>	
<b>Material/Parts</b>	<b>Troubleshooting Reference</b>
Top Center Panel Screws (10)	AIR CONDITIONER, Malfunction
Top Front Panel Screws (7)	AIR CONDITIONER, Malfunction
Right Side Panel Screws (17)	AIR CONDITIONER, Malfunction
Insulation Tape	
	<b>Approximate Time Required (in minutes)</b>
	Removal 10
	Test 10
	Installation 730
	<b>TOTAL TIME 750</b>
<b>References</b>	
Paragraph 5-8	

LOCATION/ITEM	REMARKS	ACTION
---------------	---------	--------

## REMOVAL

### TOP AND RIGHT SIDE OF HOUSING

Top Center Panel	<ol style="list-style-type: none"> <li>Remove ten (10) screws securing panel.</li> <li>Remove top center panel.</li> </ol>
Top Front Panel	<ol style="list-style-type: none"> <li>Remove seven (7) screws securing panel.</li> <li>Remove top front panel.</li> </ol>
Right Side Panel	<ol style="list-style-type: none"> <li>Remove seventeen (17) screws securing side panel.</li> <li>Remove right side panel.</li> </ol>



- c. Partially remove return air grill.

## NOTE

Testing of expansion valve is to be done while the air conditioner is operating and supplying cooling air.

Refrigerant System

Refer to paragraph 5-8 and discharge refrigerant from system.

## CAUTION

Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line. Use care to prevent damage to sensing bulb.

Expansion Valve

- Unwrap insulation tape from sensing line.
- Mark location and remove two (2) straps securing sensing bulb.
- Carefully unwrap thermostat switch sensing bulb from expansion valve sensing line.
- Unscrew and remove two (2) flare nuts securing refrigerant lines from expansion valve.
- Remove expansion valve.

G

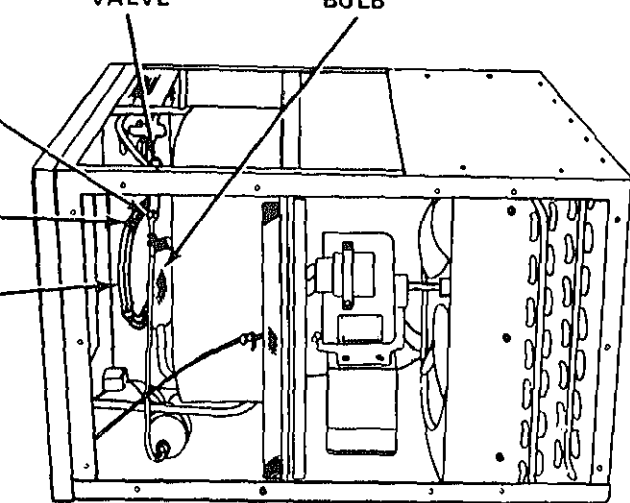
Expansion Valve

- Using a General Electric Type H-2 Leak Test Detector (or approved equivalent) test expansion valve for leaks.
- Calibrate the detector with a General Electric LS-20 leak standard (or approved equivalent) to a pure refrigerant leak rate of 0.1 ounces per year.
- Verify that there is NO leakage or damage to expansion valve.
- Replace expansion valve if testing indicates that it is defective.

RELATION

Expansion Valve

- Connect expansion valve to refrigerant system.



REMARKS

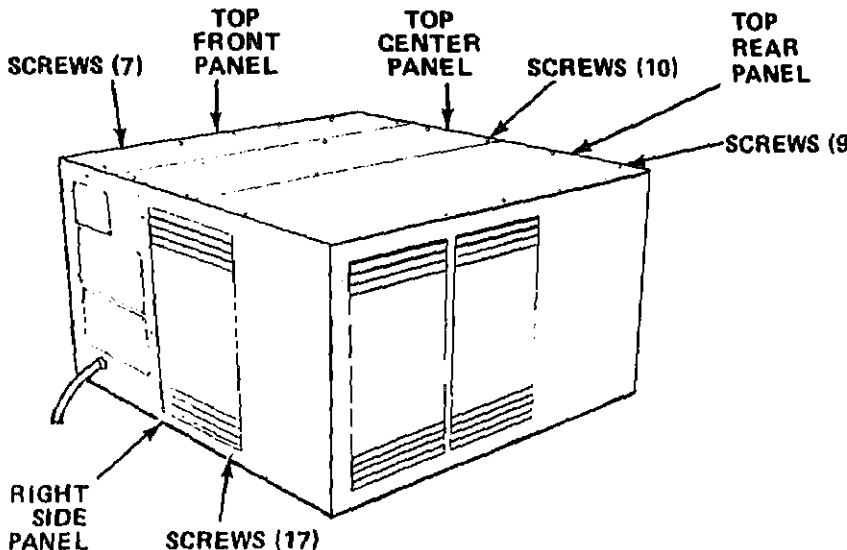
ACTION

E OF HOUSING

- a. Align holes in return air grill with holes in front panel.
- b. Secure return air grill to front panel with eight (8) screws.

Top Center Panel

- a. Align holes in top center panel with top front and top rear panels.
- b. Secure top center panel with top screws.



1001L	Fuels, Lubricants, Oil and Waxes
PAINTING	
AM-43-0139	Painting Instructions for Field Use
MAINTENANCE	
AM 38-750	The Army Maintenance Management System (TAMMS)
AM 5-4120-341-23P	Organizational and Direct Support Maintenance Repair Parts and S Tools List
CLEANING	
and Spec P-S-661	Dry Cleaning Solvent
and Spec P-D-680	Dry Cleaning Solvent
DESTRUCTION	
AM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use
EQUIPMENT AND STORAGE	
AM 740-90-1	Administrative Storage of Equipment
RADIO SUPPRESSION	
AM 11-65	Radio Interference Suppression

# Section I. INTRODUCTION

## SCOPE

Appendix lists Integral Components of and Basic Issue Items (BII) for the air conditioner to identify items required for safe and efficient operation.

## GENERAL

Components of end item list are divided into the following sections:

*Section II. Integral Components of the End Item.* These items, when assembled, comprise the air conditioner and must accompany it whenever it is transferred or turned in. These illustrations will help identify these items.

*Section III. Basic Issue Items.* These are minimum essential items required to place the air conditioner in operation, to operate it and to perform emergency repairs. Although shipped separately, they must accompany the air conditioner during operation and whenever it is transferred by authorized personnel. The illustrations will assist you with hard-to-identify items. This manual provides the authority to requisition replacement BII based on Table(s) of Organization and Equipment (TOE) or Modification Table of Organization and Equipment (MTOE) authorization of the end item.

## EXPLANATION OF COLUMNS

*Illustration.* This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown (see Table).

(2) *Item Number.* The number used to identify item called out in the illustration.

*National Stock Number (NSN).* Indicates the national stock number assigned to the end item and used for requisitioning.

*Part Number (P/N).* Indicates the primary number used by the manufacturer which contains the name and characteristics of the item by means of its engineering drawings, specifications, standardization requirements to identify an item or range of items.

*Description.* Indicates the federal item name and, if required, a minimum description to identify the item.

This section provides a general explanation of all maintenance and repair functions authorized at each maintenance level.

Section II designates overall responsibility for the performance of maintenance functions assigned to each end item or component and the work measurement time required to perform the function at the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

Section III lists the tools and test equipment required for each maintenance function as referenced in Section II (Not Applicable).

## EXPLANATION OF COLUMNS IN SECTION II

*Column (1), Group Number.* Column 1 lists group numbers to identify related components, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the AC in disassembly sequence beginning with the first group removed.

*Column (2), Component/Assembly.* This column contains the noun names of components, subassemblies and modules for which maintenance is authorized.

*Column (3), Maintenance Functions.* This column lists the functions to be performed on the component listed in Column 2. The maintenance functions are defined as follows:

(1) *Inspect.* To determine serviceability of an item by comparing its physical, mechanical characteristics with established standards through examination.

(2) *Test.* To verify serviceability and to detect incipient failure by measuring the mechanical characteristics of an item, and comparing those characteristics with prescribed standards.

(3) *Service.* Operations required periodically to keep an item in proper operating condition (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluid, and compressed air supplies.

(4) *Adjust.* To maintain within prescribed limits, by bringing into proper or exact position, the operating characteristics to specified parameters.

(5) *Align.* To adjust specified variable elements of an item to bring about optimum performance.



(10) *Overhaul*. That maintenance effort (service/action) necessary to restore an item to a fully serviceable/operational condition as prescribed by maintenance standards in applicable manuals. Overhaul is normally the highest degree of maintenance performed by the user. Overhaul does not normally return an item to a like new condition.

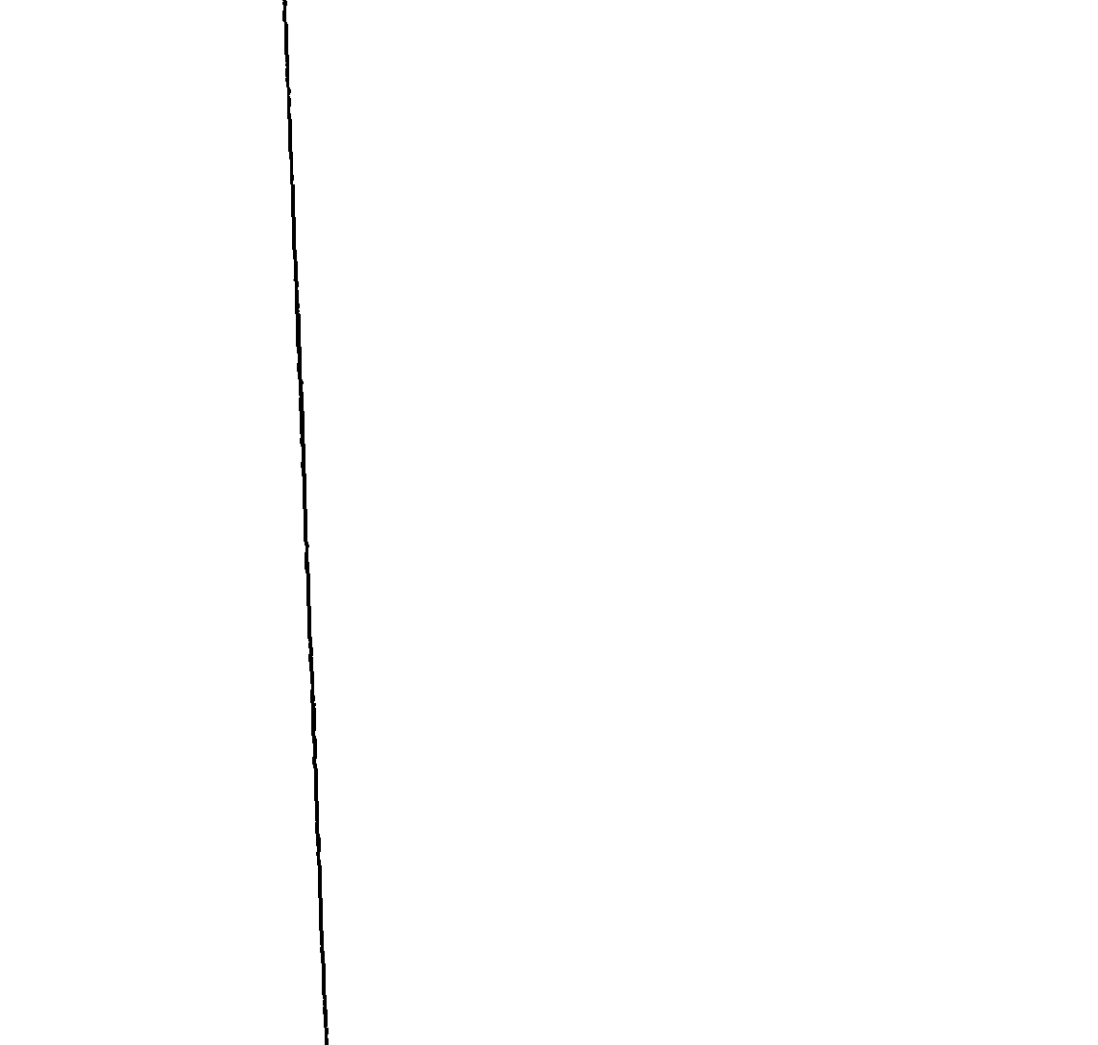
(11) *Rebuild*. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is a higher degree of material maintenance applied to Army equipment. The rebuild operation includes the replacement of parts and turning to zero those age measurements (hours/miles, etc.) considered in classifying the equipment and its parts/components.

*Column (4), Maintenance Level*. This column is made up of sub-columns for each category of maintenance. Work time figures are listed in these sub-columns for the lowest level of maintenance required to perform the function listed in column 3. These figures indicate the average actual time required to perform the maintenance function at the indicated category of maintenance under typical operating conditions.

*Column (5), Tools and Equipment*. This column is provided for referencing by code, the type and quantity of tools (not individual tools) special tools, test and support equipment required to perform the maintenance function (Not Applicable).

GROUP NUMBER	COMPONENT / ASSEMBLY	MAINTENANCE FUNCTION	SERVICE LEVEL					TOOL EQUIP
			C	O	F	H	D	
	HOUSING							
	Panels, Grills	Inspect	X					
		Repair		X				
		Replace		X				
		Adjust	X					
		Service	X					
	Drains	Inspect	X					
		Service	X					
	FILTER							
	Air Filter	Inspect						
		Service		X				
		Replace		X				
	ELECTRIC MOTOR AND FANS							
	Motor	Inspect						
		Test		X				
		Repair		X				
		Replace		X				
	Fans	Inspect						
		Repair		X				
		Replace		X				
	STARTING AND PROTECTIVE DEVICE							
	Switches	Inspect	X					
		Test		X				
		Replace		X				
	Capacitors	Test		X				

1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					5) REMARKS
			C	O	F	H	D	
	WIRING							
	Misc. Wiring	Inspect Test Repair Replace		X X X X				
	GAS COMPRESSOR, PIPING AND COMPONENTS							
	Compressor	Inspect (1) Test Service Repair Replace		X	 X X X X			
	Refrigerant Piping and Service Valves	Inspect (1) Test Repair Replace		X	 X X X			
	Evaporator Coil	Inspect Service Test Repair Replace		X X	  X X X			
	Condensor Coil	Inspect Service Test Repair Replace		X X	  X X X			



## **RAL**

identifies items that do not have to accompany the air conditioner and that do not have to be used with it. These items are authorized to you by CTA, MTOE, TDA or JTA.

### **ANATION OF LISTING**

Stock number, descriptions, and quantities are provided to help you identify and request the items you require to support this equipment. "USABLE ON" codes are identified as follows:

**Code**

**Used On**

Not Applicable

## E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain your conditioner.

These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Parts and Heraldic Items).

## E-2. EXPLANATION OF COLUMNS

*a. Column 1, Item Number.* This number is assigned to the entry in the listing and is read in conjunction with the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

*b. Column 2, Level.* This column identifies the lowest level of maintenance that requires the item.

C - Operator/Crew

O - Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

*c. Column 3, National Stock Number.* This is the National stock number assigned to the item. Request or requisition the item.

*d. Column 4, Description.* Indicates the Federal item name and, if required, a description of the item. The last line for each item indicates the part number followed by the Federal Supply Manufacturer (FSCM) in parenthesis, if applicable.

*e. Column 5, Unit of Measure (U/M).* Indicates the measure used in performing the actual function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, lb). If the measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy the requirements.

O

Dry Cleaning Solvent, P-D-680

O

Dry Cleaning Solvent, P-S-661

O

Adhesive

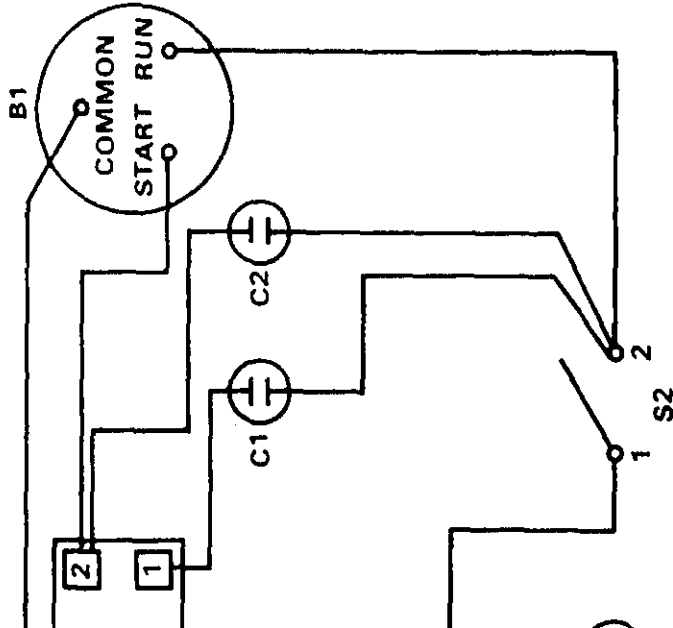
F

Refrigerant

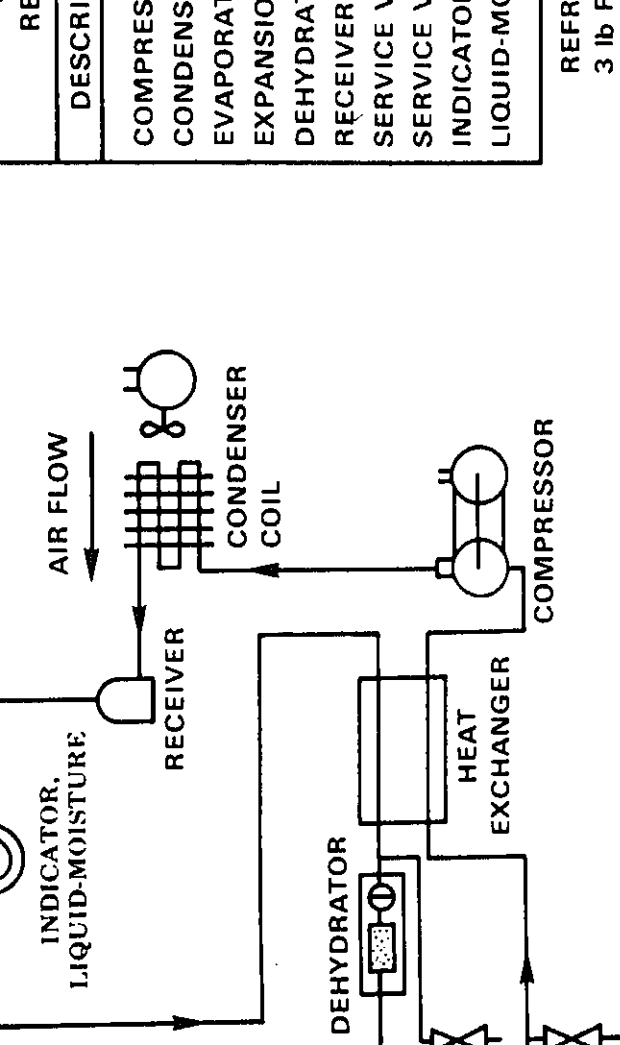
## REFRIGERANT SYSTEM DIAGRAM

ent system diagram for the air conditioner is shown in figure F-2.





REF DES	DESCRIPTION	F
S1	SELECTOR	
B1	COMPRESSOR	
S2	THERMOSTAT	
C2	RUN CAPACITOR	
C1	START CAPACITOR	
K1	START RELAY	
B2	A.C. MOTOR	



RE	DESCR
COMPRES	COMPRES
CONDENS	CONDENS
EVAPORAT	EVAPORAT
EXPANSIO	EXPANSIO
DEHYDRA	DEHYDRA
RECEIVER	RECEIVER
SERVICE V	SERVICE V
SERVICE V	SERVICE V
INDICATO	INDICATO
LIQUID-M	LIQUID-M

REFR  
3 lb F

Figure F-2. Refrigeration diagram.

.....	4
and Equipment .....	4
.....	4
.....	4
Materials.....	
Switches.....	
.....	

## D

.....	
Army Material to Prevent Enemy Use .....	
ween Models .....	
Troubleshooting Table .....	
.....	

## E

.....	4
e .....	4

## F

.....	
heck .....	

## H

.....	
.....	
and Grills .....	

## I

Direct Support Maintenance .....	
Organizational Maintenance .....	
on the Unit .....	
Source, Connect .....	
ative Maintenance Checks and Services (PMCS) .....	
se of Air Conditioner .....	

## R

erant .....	
iping .....	
iping and Service Valves .....	
ervicing .....	
ting Equipment Improvements Recommendation (RIPS) .....	
n Air Grill Check .....	
apacitor .....	

## S

or Switch .....	
e Upon REceipt Checklist .....	
Glass .....	4-3
I Tools and Test Equipment .....	4
Capacitor .....	
Relay .....	
g .....	
perating Instructions for Cooling .....	
perating Instructions for Ventilation .....	
ng Instructions .....	

## T

ostat Switch .....	
eshooting Table .....	

## V

**DISTRIBUTION:**

be distributed in accordance with DA Form 12-25C, Operator Maintenance  
Requirements for Environmental Equipment, Air Conditioners, 9,000 BTU.

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a manual states the engine <u>6</u> Cylinders. The engine on set only has <u>4</u> Cylinders. Change the manual to show Cylinders.
1		4-3		Callout 16 on figure 4-3 is pointing at a <u>bolt</u> . In key to figure 4-3, item 16 is a <u>shim</u> - Please Correct one or the other.
5	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got gasket but it doesn't fit. I ordered a new one and got it.

FILL IN YOUR  
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER

U S ARMY SUPPORT AND AVIATION MATERIEL READINESS COMMA

ATTN: DRSTS-MTT

4300 GOODFELLOW BOULEVARD

ST. LOUIS, MO 63120

PARA-  
GRAPH

FIGURE  
NO

TABLE  
NO

IN THIS SPACE TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT:



FILL IN YOUR  
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY

---

---

OFFICIAL BUSINESS

COMMANDER  
U S ARMY SUPPORT AND AVIATION MATERIEL READINESS COMMAND  
ATTN: DRSTS-MTT  
4300 GOODFELLOW BOULEVARD  
ST. LOUIS, MO 63120

20-341-13

13 Mar 81

Air conditioner 9,000 BTU/hr  
Hottel Model HAC-751

PIN-POINT WHERE IT IS

PARA-  
GRAPHFIGURE  
NOTABLE  
NOIN THIS SPACE TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT:

FILL IN YOUR  
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER

U S ARMY SUPPORT AND AVIATION MATERIEL READINESS CO

ATTN: DRSTS-MTT

4300 GOODFELLOW BOULEVARD

ST. LOUIS, MO 63120

EXACT PIN-POINT WHERE IT IS

PAGE  
NOPARA-  
GRAPHFIGURE  
NOTABLE  
NOIN THIS SPACE TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT:

FILL IN YOUR  
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER

U S ARMY SUPPORT AND AVIATION MATERIEL READINESS C

ATTN: DRST5-MTT

4300 GOODFELLOW BOULEVARD

ST. LOUIS, MO 63120

1 gram = 10 milligrams = .15 grain  
 1 gram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 gram = 10 grams = .35 ounce  
 1 gram = 10 dekagrams = .352 ounces  
 1 gram = 10 hectograms = 2.2 pounds  
 1 gram = 100 kilograms = 220.46 pounds  
 1 ton = 10 quintals = 1.1 short tons

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. in.  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. in.  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. in.  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mi.

*Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. in.  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. in.  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

<i>From</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>
	centimeters	2.540	ounce-inches	newton-meters
	meters	.305	centimeters	inches
	meters	.914	meters	feet
	kilometers	1.609	meters	yards
inches	square centimeters	6.451	kilometers	miles
feet	square meters	.093	square centimeters	square inches
yards	square meters	.836	square meters	square feet
miles	square kilometers	2.590	square meters	square yards
	square hectometers	.405	square kilometers	square miles
	cubic meters	.028	square hectometers	acres
	cubic meters	.766	cubic meters	cubic feet
	milliliters	29.673	cubic meters	cubic yards
	liters	.473	milliliters	fluid ounces
	liters	.946	liters	pints
	liters	3.785	liters	quarts
	grams	28.349	liters	gallons
	kilograms	.454	grams	ounces
	metric tons	.907	kilograms	pounds
	newton-meters	1.365	metric tons	short tons
	newton-meters	.11375		